U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-277 673

Ambient Air Quality Monitoring Network, EPA Region VIII Energy Areas

Environmental Protection Agency, Denver, Colo Region VIII

Oct 77

OCTOBER 1977 EPA-908/4-77-01

PB 277 673

AMBIENT AIR QUALITY MONITORING NETWORK EPA REGION VIII ENERGY AREAS

Environmental Protection Agency
Rocky Mountain - Prairie Region
Region VIII

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U. S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

AMBIENT AIR QUALITY MONITORING NETWORK

EPA Region VIII Energy Areas

Compiled by

Office of Energy Activities

and

Surveillance and Analysis Division

October 1977

DISCLAIMER

This report has been reviewed by the Office of Energy Activities and the Surveillance and Analysis Division of Region VIII U. S. Environmental Protection Agency, and approved for publication. Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

Document is available to the public through the National Technical Information Service, Springfield, Virginia 22151.

FOREWARD

EPA Region VIII initiated an ambient air quality monitoring network in 1974 to gather baseline data in rural areas of North Dakota, South Dakota, Wyoming and Montana expected to be impacted by energy resource development. The network was expanded in 1975 to cover energy areas in Utah and Colorado, as well as to increase the coverage in the Northern Great Plains. A previous report issued in November 1975 summarized the first year of data collection; this report summarizes the 1976 data in addition to making comparisons between the 1975 and 1976 data. The respective state air pollution control agencies are the responsible parties for the operation and maintenance of the monitoring network, data analyses and reporting. If you have questions regarding information included in this report, please contact Mr. George Boulter (303/837-5914) or Mr. Barry Levene (303/837-2226). Also, if you have suggestions for changes, additions or deletions, please provide your comments to us.

TABLE OF CONTENTS

		Page
	LIST OF FIGURES	iv
	LIST OF TABLES	vii
1.0	INTRODUCTION	1
2.0	SPECIFIC AIR QUALITY MONITORING SITE SUMMARY DATA	
	2.1 Colorado	11
	2.1.1 Rifle, Colorado	12
	2.1.2 Grand Valley, Colorado	13
	2.1.3 Grand Junction, Colorado	14
	2.1.4 Fruita, Colorado	15
	2.1.5 Palisade, Colorado	16
	2.1.6 Craig, Colorado	17
	2.1.7 Meeker, Colorado	18
	2.1.8 Rangely, Colorado	19
	2.1.9 Black Sulfur Creek, Colorado	20
	2.2 Montana	21
	2.2.1 Ekalaka, Montana (Quietus '78)	22
	2.2.2 Glendive, Montana	23
	2.2.3 Lindsay, Montana	24
	2.2.4 Fort Peck, Montana	26
	2.2.5 Broadus, Montana	29
	2.2.6 Wolf Point (Poplar), Montana	30
	2.2.7 Lame Deer, Montana	33
	2.2.8 Decker, Montana	36
	2.2.9 Miles City, Montana (Otter Creek '78)	37
	2.2.10 Hardin, Montana	38
	2.2.11 Scobey -3, Montana	39
	2.2.12 Colstrip, Montana BN	42
	2.2.13 Colstrip, Montana McCrea	47
	2.2.14 Scobey -1, Montana (Reserved)	
	2.2.15 Scobey -2, Montana (Reserved)	
	2.2.16 Red Lodge, Montana (Reserved)	
	2.3 North Dakota	53
	2.3.1 Medora, North Dakota	54
	2.3.2 Bowman, North Dakota	55
	2.3.3 Mott, North Dakota	56
	2.3.4 Garrison, North Dakota	59
	2.3.5 Washburn, North Dakota	61
	2.3.6 Parshall, North Dakota	64
	2.3.7 McClusky, North Dakota	65
	2.3.8 Stanton, North Dakota	67

TABLE OF CONTENTS (Continued)

Page

2.4 South Dakota 73

2.4.1 Buffalo, South Dakota 74
2.4.2 Belle Fourche, South Dakota (Newell, '78) 78
2.4.3 Lemmon, South Dakota 81

2.5 Utah 82

2.5.1 Castle Dale, Utah 84
2.5.2 Huntington, Utah 86
2.5.3 Price, Utah 88
2.5.4 Cedar City, Utah 90
2.5.5 Bullfrog Basin, Utah 92
2.5.6 Wahweap Marina, Utah 94
2.5.7 Hurricane, Utah 96
2.5.8 Vernal, Utah (reserved)
2.5.9 Green River, Utah (temporary) (reserved)
2.5.10 Nephi, Utah (reserved)

2.6 Wyoming 99

2.6.1 Buffalo, Wyoming 101
2.6.2 Gillette, Wyoming 102
2.6.3 Lusk, Wyoming 107
2.6.4 Newcastle, Wyoming 111
2.6.5 Rock Springs, Wyoming 114
2.6.6 Afton, Wyoming 115
2.6.7 Irene Ranch, Wyoming 116
2.6.8 Burks Ranch, Wyoming 117
2.6.9 Gordon Ranch, Wyoming 118
2.6.10 Bill, Wyoming 119
2.6.11 Kemmerer, Wyoming 122
2.6.12 Wheatland, Wyoming 124
2.6.13 Converse County, Wyoming (Douglas) 127
2.6.14 Sweetwater County, Wyoming (Patrick, Draw) 130

3.0 COMPARISONS OF PEDCO AND STATE DATA FOR THE NGPRP SITES - CALENDAR YEAR '75 - '76 DATA COMPARISONS 133

LIST OF FIGURES

Figure	
1.1	Locations of Air Quality Monitoring Equipment in Energy Areas in Region VIII in FY 77
1.2	Locations of Air Quality Monitoring Equipment in Energy Areas in Region VIII in FY '78
2.1.1	Summary of TSP Data at Rifle, Colorado
2.1.2	Summary of TSP Data at Grand Valley, Colorado
2.1.3	Summary of TSP Data at Grand Junction, Colorado
2.1.4	Summary of TSP Data at Fruita, Colorado
2.1.5	Summary of TSP Data at Palisade, Colorado
2.1.6	Summary of TSP Data at Craig, Colorado
2.1.7	Summary of TSP Data at Meeker, Colorado
2.1.8	Summary of TSP Data at Rangely, Colorado
2.1.9	Summary of TSP Data at Black Sulfur Creek, Colorado
2.2.1	Summary of TSP Data at Ekalaka, Montana
2.2.2	Summary of TSP Data at Glendive, Montana
2.2.3.1	Summary of TSP Data at Lindsay, Montana (Dual Site)
2.2.3.2	Summary of TSP Data at Lindsay, Montana (Dual Site)
2.2.4.1	Summary of TSP Data at Fort Peck, Montana
2.2.4.2	Summary of SO_2 Bubbler Data at Fort Peck, Montana
2.2.4.3	Summary of NO_x Bubbler Data at Fort Peck, Montana
2.2.5	Summary of TSP Data at Broadus, Montana
2.2.6.1	Summary of TSP Data at Wolf Point, Montana (Poplar)
2.2.6.2	Summary of NO_x Continuous Data at Wolf Point, Montana (Poplar)
2.2.7.1	Summary of TSP Data at Lame Deer, Montana
2.2.7.2	Summary of SO_2 Bubbler Data at Lame Deer, Montana
2.2.7.3	Summary of NO_x Bubbler Data at Lame Deer, Montana
2.2.8	Summary of TSP Data at Decker, Montana
2.2.9	Summary of TSP Data at Miles City, Montana
2.2.10	Summary of TSP Data at Hardin, Montana
2.2.11.1	Summary of TSP Data at Scobey -3, Montana
2.2.11.2	Summary of SO_2 Bubbler Data at Scobey -3, Montana
2.2.11.3	Summary of NO_x bubbler data at Scobey -3, Montana
2.2.12.1	Summary of TSP Data at Colstrip, Montana (BN)
2.2.12.2	Summary of SO_2 Bubbler Data at Colstrip, Montana (BN)
2.2.12.3	Summary of SO_2 Continuous Data at Colstrip, Montana (BN)
2.2.12.4	Summary of NO_x Bubbler Data at Colstrip, Montana (BN)
2.2.12.5	Summary of NO_x Continuous Data at Colstrip, Montana (BN)
2.2.13.1	Summary of TSP Data at Colstrip, Montana (Macrae)
2.2.13.2	Summary of SO_2 Bubbler Data at Colstrip, Montana (Macrae)
2.2.13.3	Summary of SO_2 Continuous Data at Colstrip, Montana (Macrae)
2.2.13.4	Summary of NO_x Bubbler Data at Colstrip, Montana (Macrae)
2.2.13.5	Summary of NO_x Continous Data at Colstrip, Montana (Macrae)
2.3.1	Summary of TSP Data at Medora, North Dakota
2.3.2	Summary of TSP Data at Bowman, North Dakota
2.3.3.1	Summary of TSP Data at Mott, North Dakota
2.3.3.2	Summary of SO_2 Bubbler Data at Mott, North Dakota
2.3.3.3	Summary of NO_x Bubbler Data at Mott, North Dakota
2.3.4.1	Summary of TSP Data at Garrison, North Dakota
2.3.4.2	Summary of Membrane Data at Garrison, North Dakota

LIST OF FIGURES (Continued)

Figure

2.3.5.1 Summary of TSP Data at Washburn, North Dakota
2.3.5.2 Summary of SO_2 Bubbler Data at Washburn, North Dakota
2.3.5.3 Summary of NO_x Bubbler Data at Washburn, North Dakota
2.3.6 Summary of TSP Data at Parshall, North Dakota
2.3.7.1 Summary of TSP Data at McClusky, North Dakota (Dual Site)
2.3.7.2 Summary of TSP Data at McClusky, North Dakota (Dual Site)
2.3.8.1 Summary of TSP Data at Stanton, North Dakota
2.3.8.2 Summary of SO_2 Continuous Data at Stanton, North Dakota
2.3.8.3 Summary of SO_2 Bubbler Data at Stanton, North Dakota
2.3.8.4 Summary of NO_x Bubbler Data at Stanton, North Dakota
2.3.8.5 Summary of NO_x Continuous Data at Stanton, North Dakota

2.4.1.1 Summary of TSP Data at Buffalo, South Dakota (Dual Site)
2.4.1.2 Summary of TSP Data at Buffalo, South Dakota (Dual Site)
2.4.1.3 Summary of SO_2 Bubbler Data at Buffalo, South Dakota
2.4.1.4 Summary of NO_x Bubbler Data at Buffalo, South Dakota
2.4.2.1 Summary of TSP Data at Belle Fourche, South Dakota
2.4.2.2 Summary of SO_2 Bubbler Data at Belle Fourche, South Dakota
2.4.2.3 Summary of NO_x Bubbler Data at Belle Fourche, South Dakota
2.4.3 Summary of TSP Data at Lemmon, South Dakota

2.5.1.1 Summary of TSP Data at Castle Dale, Utah
2.5.1.2 Summary of SO_2 Continuous Data at Castle Dale, Utah
2.5.2.1 Summary of TSP Data at Huntington, Utah
2.5.2.2 Summary of SO_2 Continuous Data at Huntington, Utah
2.5.3.1 Summary of TSP Data at Price, Utah
2.5.3.2 Summary of SO_2 Continuous Data at Price, Utah
2.5.4.1 Summary of TSP Data at Cedar City, Utah
2.5.4.2 Summary of SO_2 Continuous Data at Cedar City, Utah
2.5.5.1 Summary of TSP Data at Bullfrog Basin, Utah
2.5.5.2 Summary of SO_2 Continuous Data at Bullfrog Basin, Utah
2.5.6.1 Summary of TSP Data at Wahweap Marina, Utah
2.5.6.2 Summary of SO_2 Continuous Data at Wahweap Marina, Utah
2.5.7.1 Summary of TSP Continuous Data at Hurricane, Utah
2.5.7.2 Summary of SO_2 Continuous Data at Hurricane, Utah
2.5.7.3 Summary of NO_x Bubbler Data at Hurricane, Utah

2.6.1 Summary of TSP Data at Buffalo, Wyoming
2.6.2.1 Summary of TSP Data at Gillette, Wyoming
2.6.2.2 Summary of SO_2 Bubbler Data at Gillette, Wyoming
2.6.2.3 Summary of SO_2 Continuous Data at Gillette, Wyoming
2.6.2.4 Summary of NO_x Continuous Data at Gillette, Wyoming
2.6.2.5 Summary of NO_x Bubbler Data at Gillette, Wyoming
2.6.3.1 Summary of TSP Data at Lusk, Wyoming (Dual Site)
2.6.3.2 Summary of TSP Data at Lusk, Wyoming (Dual Site)
2.6.3.3 Summary of SO_2 Bubbler Data at Lusk, Wyoming
2.6.3.4 Summary of NO_x Bubbler Data at Lusk, Wyoming
2.6.4.1 Summary of TSP Data at Newcastle, Wyoming
2.6.4.2 Summary of SO_2 Bubbler Data at Newcastle, Wyoming
2.6.4.3 Summary of NO_x Bubbler Data at Newcastle, Wyoming

LIST OF FIGURES (Continued)

Figure

2.6.5 Summary of TSP Data at Rock Springs, Wyoming
2.6.6 Summary of TSP Data at Rock Springs, Wyoming
2.6.7 Summary ot TSP Data at Irene Ranch, Wyoming
2.6.8 Summary of TSP Data at Burks Ranch, Wyoming
2.6.9 Summary of TSP Data at Gordon Ranch, Wyoming
2.6.10.1 Summary of SO_2 Bubbler Data at Bill, Wyoming
2.6.10.2 Summary of NO_x Bubbler Data at Bill, Wyoming
2.6.11.1 Summary of TSP Data at Kemmerer, Wyoming
2.6.11.2 Summary of SO_2 Bubbler Data at Kemmerer, Wyoming
2.6.11.3 Summary of NO_2 Bubbler Data at Kemmerer, Wyoming
2.6.12.1 Summary of TSP Data at Wheatland, Wyoming
2.6.12.2 Summary of SO_2 Bubbler Data at Wheatland, Wyoming
2.6.12.3 Summary of NO_x Bubbler Data at Wheatland, Wyoming
2.6.13.1 Summary of TSP Data at Douglas, Wyoming
2.6.13.2 Summary of SO_2 Continuous Data at Douglas, Wyoming
2.6.13.3 Summary of NO_2 Continuous Data at Douglas, Wyoming
2.6.14.1 Summary of TSP Data at Patrick Draw, Wyoming
2.6.14.2 Summary of SO_2 Continuous Data at Patrick Draw, Wyoming
2.6.14.3 Summary of NO_2 Continuous Data at Patrick Draw, Wyoming

3.1 Map Showing Comparison of PEDCo '75 to State '76 Annual Geometric
3.2 Map Showing Comparison of PEDCo '75 to State '76 Maximum 24 hour TSP Value
3.3 Map Showing Comparison of PEDCo '75 to State '76 Annual Arithmetic Mean SO_2 Values
3.4 Map Showing Comparison of PEDCo '75 to State '76 Maximum 24 hour SO_2 Values
3.5 Map Showing Comparison of PEDCo '75 to State '76 Annual Arithmetic Mean NO_x Values
3.6 Map Showing Comparison of PEDCo '75 to State '76 Maximum 24 hour NO_x Values
3.7 Map Showing Comparison of Calendar Year '75 to Calendar Year '76 Annual Geometric Mean TSP Values
3.8 Map Showing Comparison of Calendar Year '75 to Calendar Year '76 Maximum 24 hour TSP Values
3.9 Map Showing Comparison of Calendar Year '75 to Clanedar Year '76 Annual Arithmetic Mean SO_2 Values
3.10 Map Showing Comparison of Calendar Year '75 to Calendar Year '76 Maximum 24 hour SO_2 Values
3.11 Map Showing Comparison of Calendar Year '75 to Calendar Year '76 Arithmetic Mean NO_x Values
3.12 Map Showing Comparison of Calendar Year '75 to Calendar Year '76 24 Hour NO_x Values

LIST OF TABLES

Table		Page
1.1	Air Quality Monitoring Equipment in Energy Areas in FY '77	5
1.2	Air Quality Monitoring Equipment in Energy Areas in FY '78	7
1.3	National Ambient Air Quality Standards (NAAQS)	9
1.4	Incremental Increases Allowed under Prevention of Significant Deterioration (PSD) of Air Quality by the Clean Air Act (CAA) Amendments of 1977.	10
2.2.6	Summary of Continuous Ozone Data from Wolf Point, Montana	32
2.2.12	Summary of Continuous Ozone Data from Colstrip (BN & McCrea), Montana	52
2.3.8	Summary of Continuous Ozone Data from Stanton, North Dakota	72

SECTION 1.0

INTRODUCTION

Large areas of Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming may be affected by air pollutants emitted by planned energy extraction and conversion facilities as well as associated growth. Coal mining, oil shale mining and processing, coal gasification, and electric generation as well as other emerging technologies will result in increased atmospheric pollutant levels. In order to determine background pollutant concentration data, against which to compare future air quality degradation, an ambient air monitoring network of twenty-two stations was estbalished by PEDCo Environmental in September 1974, under contract to Region VIII, U.S. EPA. These stations were established in the states of Montana, North Dakota, South Dakota, and Wyoming as part of the Northern Great Plains Resource Program (NGPRP). In August 1975, after PEDCo operated the network for twelve months, each state involved in the NGPRP study took over the responsibility for it and has continued the work. The Office of Energy Activities (OEA) of Region VIII has funded an additional twenty-five sites in Montana, Wyoming, Colorado and Utah. For many of these sites which have only recently become active, only a limited amount of data is available for analysis.

All forty-seven sites as they appeared in FY '77 are located on the map in Figure 1.1, Figure 1.2 locates the sites as they will appear in FY '78. Table 1.1 summaries the equipment located at each site.

Section 2.0 presents summaries of ambient air quality data from the two years of NGPRP data, summaries of ambient air quality data from the twenty-five sites added to the energy sampling network, and twelve sites which are operated by the individual states (but not funded by OEA) and are located in possible energy impacted areas. These data are also being gathered to determine pre-development background values as well as trend information. As more data becomes available, more definitive comparison with this base data can be made.

In Section 3.0 of this report, the data collected by PEDCo from September 1974 to August 1975 is compared to the data each state collected during a similar time period, third quarter 1975 to second quarter 1976. In a separate set of figures data from calendar year 1975 is compared with data from calendar year 1976 for those sites that the contractor initially established. Since the states have assumed operation of the sites two general conclusions can be drawn: (1) Annual TSP values were higher in 1976 than in 1975; (2) A short-term SO_2 and NO_x values were higher in 1976 than in 1975. The data summarized from calendar years 1975 and 1976 agrees with the first conclusion but not the second. Not enough data have been collected to determine long-term trends with any degree of accuracy.

In some cases summary statistics used in this report suffer from an incomplete data base due to lengthy data gaps and data processing problems. Analyses are based on data currently stored on the EPA data bank.

Fig. 1.2 - Locations of Monitoring Sites in Region VIII Energy Areas which were funded by OEA in FY '77 (See Table 1.1 for Key)

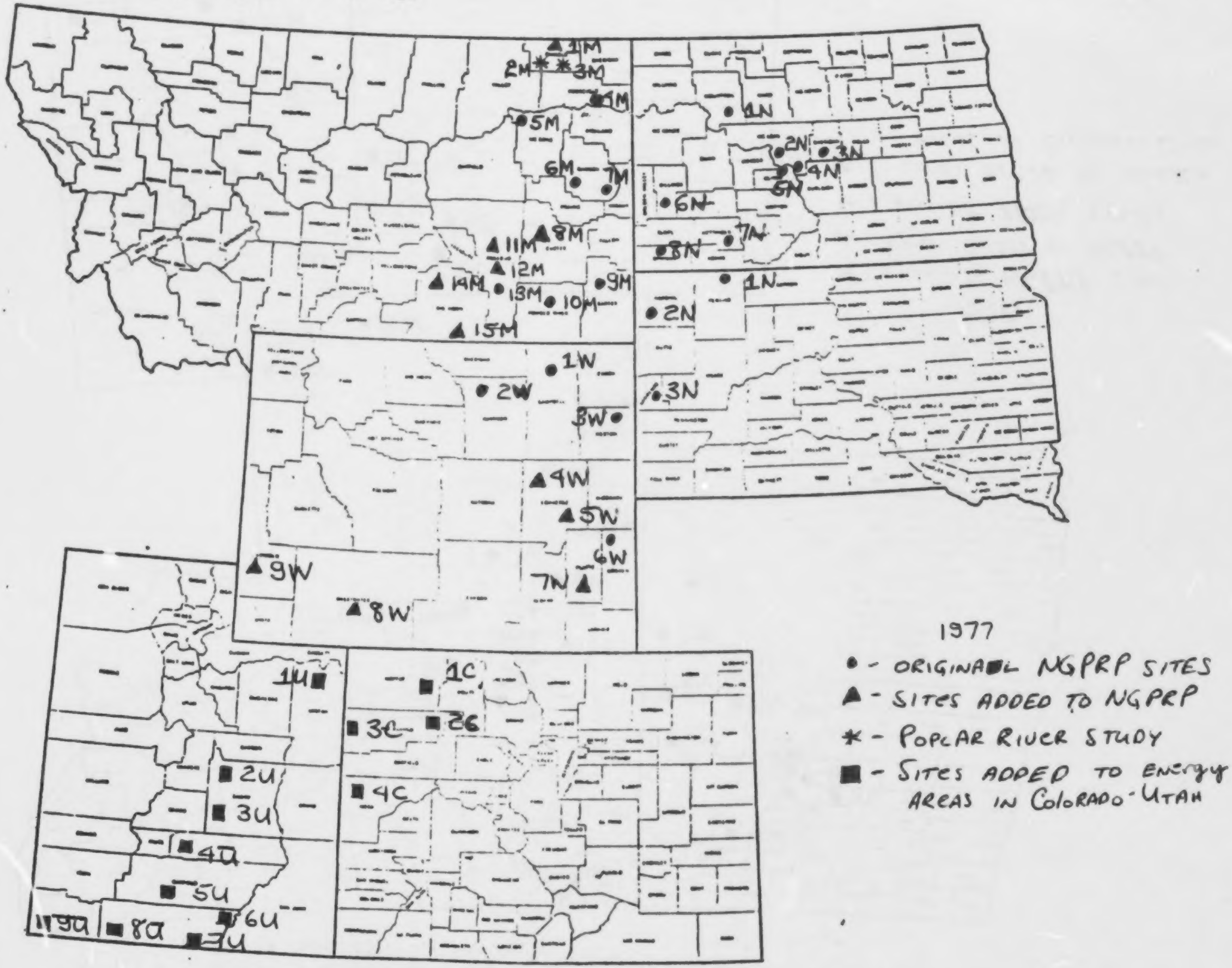

1M
2M
3M
4M
5M
6M
7M
8M
9M
10M
11M
12M
13M
14M
15M
1N
2N
3N
4N
5N
6N
7N
8N
1N
2N
3N
1W
2W
3W
4W
5W
6W
7N
8W
9W
1U
2U
3U
4U
5U
6U
7U
8U
9U
1C
2C
3C
4C
1977
● - ORIGINAL NGPRP SITES
▲ - SITES ADDED TO NGPRP
✱ - POPLAR RIVER STUDY
■ - SITES ADDED TO ENERGY AREAS IN COLORADO-UTAH

Fig. 1.2 - Locations of Monitoring Sites in Region VIII Energy Areas which will be funded by OEA in FY '78 (See Table 1.2 for Key).

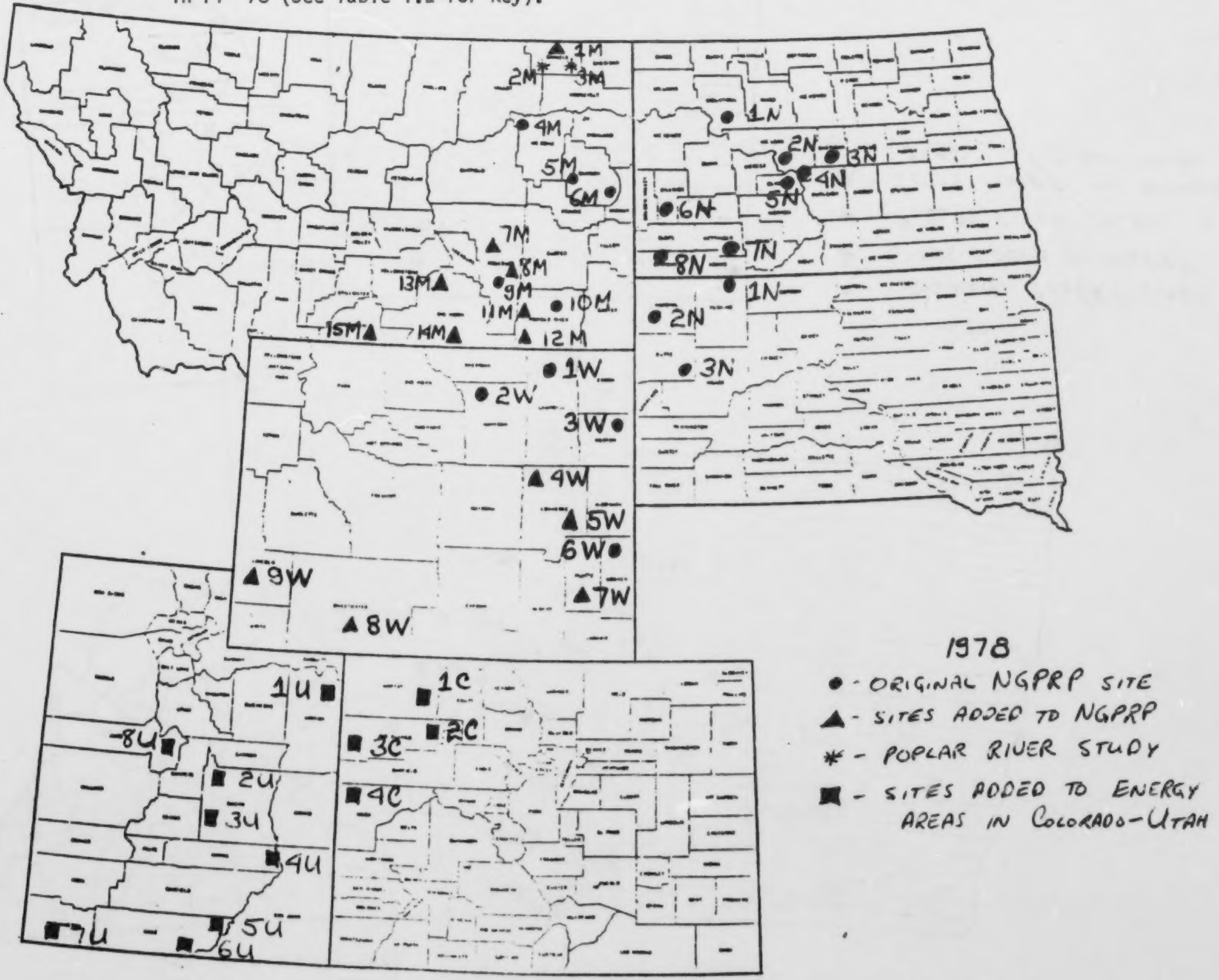

1M
2M
3M
4M
5M
6M
7M
8M
9M
10M
11M
12M
13M
14M
15M
1N
2N
3N
4N
5N
6N
7N
8N
1N
2N
3N
1W
2W
3W
4W
5W
6W
7W
8W
9W
1C
2C
3C
4C
1U
2U
3U
4U
5U
6U
7U
8U
1978
● - ORIGINAL NGPRP SITE
▲ - SITES ADDED TO NGPRP
* - POPLAR RIVER STUDY
■ - SITES ADDED TO ENERGY AREAS IN COLORADO-UTAH

TABLE 1.1 - Air Quality Monitoring Equipment in Energy Areas (Funded by OEA) in FY '77

Location	Hi-Vol	Membrane	SO_2-NO_x Bubbler	SO_2-NO_x Continuous	Ozone Continuous
Colorado					
1C) Craig			x		
2C) Meeker		x			
3C) Rangeley			x		
4C) Grand Junction			x		
Montana					
1M) Scobey-3	x		x		
2M) Scobey-2	x				
3M) Scobey-1	x				
4M) Poplar	x				
5M) Ft. Peck	x	x	x		
6M) Lindsay	xx				
7M) Glendive	x	x			
8M) Miles City	x				
9M) Ekalaka	x				
10M) Broadus	x				
11M) Colstrip-BN	x		x	x x	x
12M) Colstrip-McCrea	x		x		
13M) Lame Deer	x		x		
14M) Hardin	x				
15M) Decker	x				
North Dakota					
1N) Parshall	x				
2N) Garrison	x	x			
3N) McClusky	xx				
4N) Washburn	x		x		
5N) Stanton	x		x	x x	x
6N) Medora	x				
7N) Mott	x		x		
8N) Bowman	x				
South Dakota					
1N) Lemmon	x				
2N) Buffalo	xx		x		
3N) Belle Fourche	x	x	x		

Table 1.1 (Continued)

Location	Hi-Vol	Membrane	SO_2-NO_x Bubbler	SO_2-NO_x Continuous	Ozone Continuous
Utah					
1U) Vernal	x			x x	
2U) Huntington	x			x x	
3U) Castle Dale	x			x x	
4U) Caineville	x			x x	
5U) Escalante	x	x		x x	
6U) Bullfrog Basin	x			x	
7U) Wahweap Marina	x			x	
8U) Kanab	x			x x	
9U) Hurricane	x			x x	
Wyoming					
1W) Gillette	x	x	x	x x	x
2W) Buffalo	x	x			
3W) New Castle	x	x	x		
4W) Bill			x		
5W) Douglas	x			x x	
6W) Lusk	xx	x	x		
7W) Wheatland	x		x		
8W) Patrick Draw	x			x x	
9W) Kemmerer	x		x		

TABLE 1.2 - Air Quality Monitoring Equipment in Energy Areas (Funded by OEA) in FY '78

Location	Hi-Vol	Membrane	SO_2-NO_x Bubbler	SO_2-NO_x Continuous	Ozone Continuous
Colorado					
1C) Craig			x		
2C) Meeker		x			
3C) Rangely			x		
4C) Grand Junction			x		
Montana					
1M) Scobey -3	x		x		
2M) Scobey -2	x				
3M) Scobey -1	x				
4M) Ft. Peck	x				
5M) Lindsay	x				
6M) Glendive	x	x		x x	x
7M) Colstrip-BN	x				
8M) Colstrip-McCrea	x				
9M) Lame Deer	x		x		
10M) Broadus	x				
11M) Otter Creek	x				
12M) Quietus	x	x			
13M) Hardin	x				
14M) Decker	x				
15M) Red Lodge	x				
North Dakota					
1N) Parshall	x				
2N) Garrison	x	x			
3N) McClusky	x				
4N) Washburn	x		x		
5N) Stanton	x				
6N) Medora	x		x	x x	x
7N) Mott	x		x		
8N) Bowman	x				
South Dakota					
1S) Lemmon	x				
2S) Buffalo	x		x		
3S) Newell	x	x	x		

Table 1.2 (Continued)

Location	Hi-Vol	Membrane	SO_2-NO_x Bubbler	SO_2-NO_x Continuous		Ozone Continuous
Utah						
1U) Vernal	x			x	x	
2U) Huntington	x			x	x	
3U) Castle Dale	x			x	x	
4U) Green River (temp.)	x			x	x	
5U) Bullfrog Basin	x			x		
6U) Wahweap Marina	x			x		
7U) Hurricane	x			x	x	
8U) Nephi	x			x	x	
Wyoming						
1W) Gillette	x	x	x			
2W) Buffalo	x	x				
3W) New Castle	x	x	x			
4W) Bill			x			
5W) Douglas	x					
6W) Lusk	x	x	x			
7W) Wheatland	x					
8W) Patrick Draw	x		x			
9W) Kemmerer	x			x	x	

TABLE 1.3 - National Ambient Air Quality Standards (NAAQS)

POLLUTANT	PRIMARY STANDARD[1]		SECONDARY STANDARD[2]	
	Annual	Short Term[3]	Annual	Short Term[3]
Total Suspended Particulate (TSP)	75 ug/m^3 Geometric Mean	260 ug/m^3 24 hr. Maximum	- -	150 ug/m^3 24 hr. maximum
Sulfur Oxides	80 ug/m^3 Arithmetic Mean	365 ug/m^3 24 hr. maximum	-	1300 ug/m^3 3 hr. maximum
Nitrogen Oxides (as Nitrogen Dioxide)	100 ug/m^3 Arithmetic Mean	- -	100 ug/m^3 Arithmetic Mean	-
Photochemical Oxidants	-	160 ug/m^3 1 hr. maximum	-	160 ug/m^3 1 hr. maximum
Hydrocarbons (non-methane)	-	160 ug/m^3 3 hr. maximum (6 to 9 a.m.)	-	160 ug/m^3 3 hr. maximum (6 to 9 a.m.)
Carbon Monoxide	-	10,000 ug/m^3 8 hr. maximum 40,000 ug/m^3 1 hr. maximum	-	10,000 ug/m^3 8 hr. maximum 40,000 ug/m^3 1 hr. maximum

1. Primary Standards are set to protect human health.
2. Secondary standards are set to protect human welfare (plants, animals, materials, etc.)
3. Short term concentrations are only to be exceeded once per year.

ug/m^3 = micrograms of pollutant/cubic meter of air @ STP.

TABLE 1.4 Incremental Increases Allowed under Prevention of Significant Deterioration (PSD) of Air Quality by the Clean Air Act (CAA) Amendments of 1977.

CLASS	TSP		SO_2		
	Annual Geometric Mean	24 hr. Max.	Annual Arithmetic Mean	24 hr. Max.	3 hr. Max
I*	5 ug/m	10 ug/m^3	2 ug/m^3	5 ug/m^3	25 ug/m^3
II	19 ug/m^3	37 ug/m^3	20 ug/m^3	91 ug/m^3	512 ug/m^3
III	37 ug/m^3	75 ug/m^3	40 ug/m^3	182 ug/m^3	700 ug/m^3

* All National Parks exceeding 6000 acres in size, National Memorial Parks exceeding 5000 acres in size, international parks, and national wilderness areas exceeding 5000 acres in size are Class I PSD areas. After the date of enactment of the Act a new national park, wilderness area, national monument, primitive area, preserve, recreation area, wild and scenic river, wildlife refuge, lakeshore, or seashore of more than 10,000 acres may only be classified as a Class I or Class II. In Region VIII the Cheyenne Indian Reservation has been reclassified Class I, before enactment of the Act, and Dunn County in North Dakota has requested reclassification to Class I.

SECTION 2.1

COLORADO

Of the nine monitors included in this section, see Figures 2.1.1 thru 2.19, only four are funded by OEA. These four sites, located in the oil shale development area of Colorado, currently collect TSP data, only. The OEA funds will add SO_2 - NO_x bubblers to the Grand Junction, Rangely, and Craig sites, while a membrane sampler is added to the Meeker site. As of the summer of 1977 the State of Colorado has contracted with Mesa College to collect data from the monitors. The sites have been selected and local personnel have been recruited and will be trained to run the monitors. Data collection should begin during the third or fourth quarter of 1977 and data should be available in early 1978.

The report also summarizes data from five additional sites which are run by the state and are funded through the EPA State program grant (CAA Section 105). These sites were summarized in this report because they are located within an identified energy AQMA and are population oriented. All nine of these sites together should provide good information on pre-energy development air quality as well as the effects of rapidly expanding industry and related growth in the population centers.

Total Suspended Particulate

Three of these sites, Rifle, Grand Valley and Craig, have experienced multiple violations of the primary NAAQS for TSP. All of the nine sites have more than two consecutive years of data except the site at Grand Junction. The missing data from the Grand Junction, Rifle, and Black Sulfur Creek is due to some malfunction at the state level, either equipment malfunction or data loss, etc.

Sulfur Dioxide

No sulfur dioxide data has at yet been reported. Bubblers will be placed at Grand Junction, Rangely and Craig. Sampling should begin during the 3rd or 4th quarter of 1977.

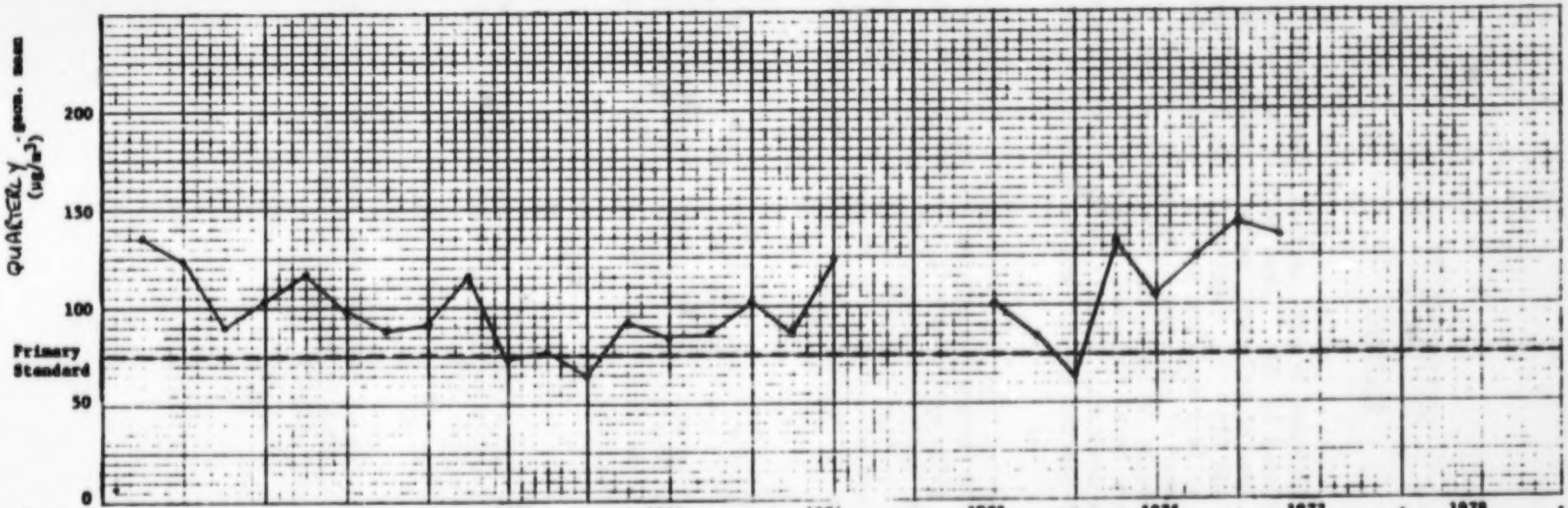
Nitrogen Oxides

No nitrogenoxides data has at yet been reported. Bubblers will be placed at Grand Junction, Rangely and Craig. Sampling should begin during the 3rd or 4th quarter of 1977.

Fig. 2.1.1

TSP

Site Location: Rifle, Colo.
Site Code: 060880001F01



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.	30	30	26	20	22	22	21	21	23	23	15	21	22	22	19	17	11	19	0	0	0	3	21	10	11	2	22	19	23							
Maximum (µg/m³)	385	284	180	293	307	364	229	272	320	218	124	168	339	190	154	232	595	239				105	155	114	671	269	255	223	377							
2nd Max. (µg/m³)	320	263	134	186	264	225	170	182	210	135	112	128	223	162	144	205	387	238				105	159	101	393	91	232	205	281							
Quarterly geom. mean (µg/m³)	137	124	91	104	117	98	87	92	117	74	77	65	93	84	87	102	87	129				*101	85	69	133	*105	127	192	137							
No. of Obs >260 µg/m³	4	2	0	1	2	1	0	1	1	0	0	0	1	0	0	0	3	.				-	.	.	2	1	0	0	4							
No. of Obs >130 µg/m³	12	10	1	2	9	5	2	4	8	1	0	1	5	2	1	5	6	9				.	9	.	6	1	11	9	11							
No. of Obs/yr.	106				86				82				80																							

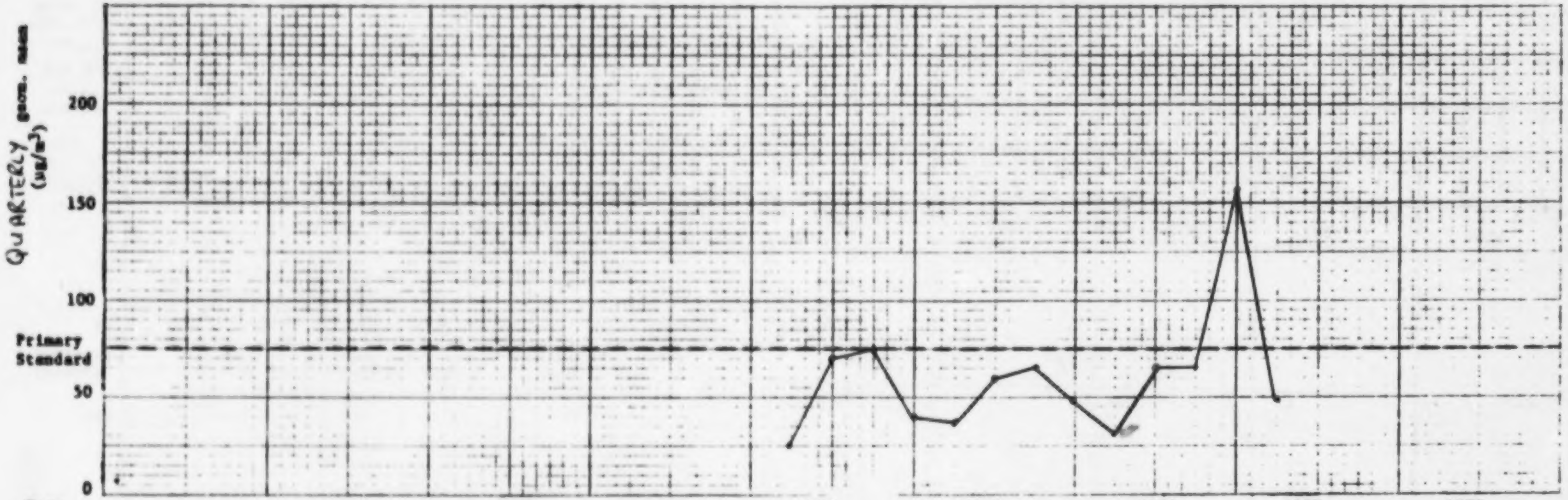
* Value derived from data which do not meet summarization criteria

Fig 2.1.2.

TSP

Site Location: GRAND VALLEY, COLO

Site Code: 060880003F01



Year / Quarter	1970 1	2	3	4	1971 1	2	3	4	1972 1	2	3	4	1973 1	2	3	4
No. of Obs.																
Maximum (ug/m³)																
2nd Max. (ug/m³)																
Quarterly geom. mean (ug/m³)																
No. of Obs >260 ug/m³																
No. of Obs >150 ug/m³																

Year / Quarter	1974 1	2	3	4	1975 1	2	3	4	1976 1	2	3	4	1977 1	2	3	4	1978 1	2	3	4
No. of Obs.	23	17	23	20	15	18	23	22	18	19	19	22	22							
Maximum (ug/m³)	124	189	176	215	180	135	159	185	92	150	142	361	198							
2nd Max. (ug/m³)	92	188	161	161	115	127	139	131	47	146	126	342	156							
Quarterly geom. mean (ug/m³)	26	71	75	40	37	60	66	48	31	66	66	157	49							
No. of Obs >260 ug/m³	-				-				-	-	-	4	-							
No. of Obs >150 ug/m³	-	2	2	2	1	-	1	1	-	-	-	13	2							

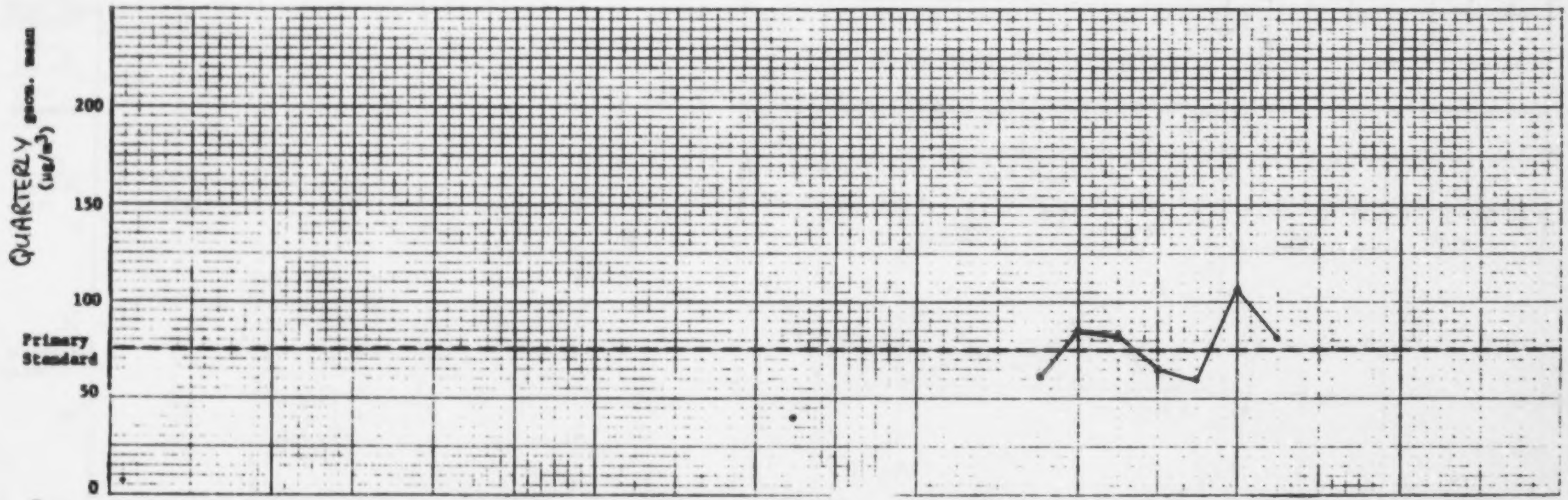
* Value derived from data which do not meet summarization criteria

Fig 2.1.3.

TSP

Site Location: GRAND JUNCTION, COLO.

Site Code: 06098001OF01

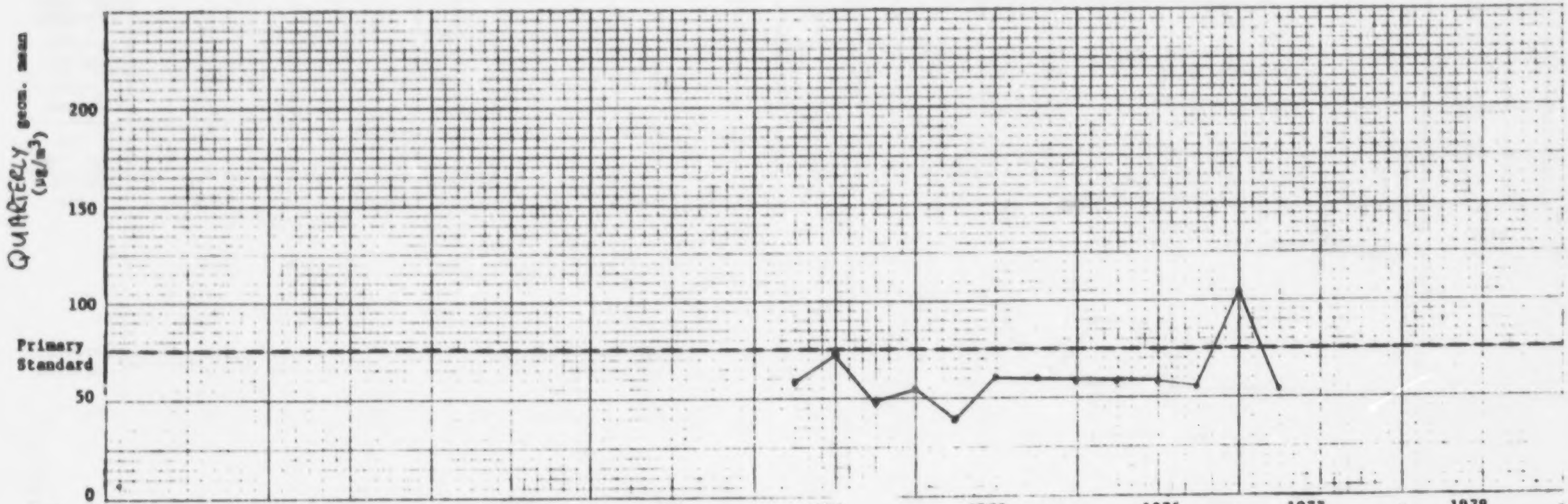


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																	4						8	23	21	18	23	23	23							
Maximum ($\mu g/m^3$)																	63						105	231	156	118	156	168	176							
2nd Max. ($\mu g/m^3$)																	42						102	153	153	106	91	145	159							
Quarterly geom. mean ($\mu g/m^3$)																	40*						61*	85	83	66	60	107	81							
No. of Obs >260 $\mu g/m^3$																	-						-	-	-		-	-	-							
No. of Obs >150 $\mu g/m^3$																	-						-	2	2	-	1	1	2							

* Value derived from data which do not meet summarization criteria.

Fig 2.1.4.
TSP

Site Location: FRUITA, Colo.
Site Code: 061520001F01

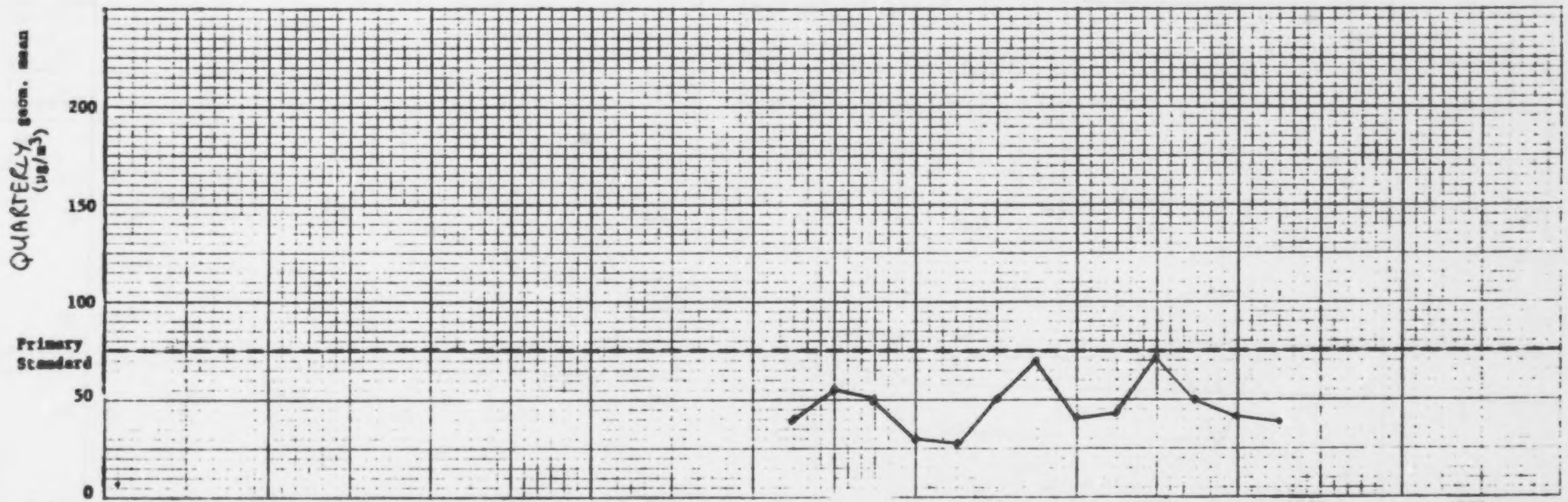


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																	21	21	23	22	22	21	23	23	22	15	21	23	22							
Maximum (µg/m³)																	102	158	104	157	107	294	109	177	142	115	108	155	113							
2nd Max. (µg/m³)																	100	137	97	91	99	198	103	113	128	111	98	145	93							
Quarterly geom. mean (µg/m³)																	58	73	48	54	39	61	60	58	58	57	55	104	54							
No. of Obs >260 µg/m³																						1														
No. of Obs >150 µg/m³																		1		1		1		1				1								

* Value derived from data which do not meet summarization criteria.

Fig 2.1.5.
TSP

Site Location: PALISADE, Colo.
Site Code: 061520002F01

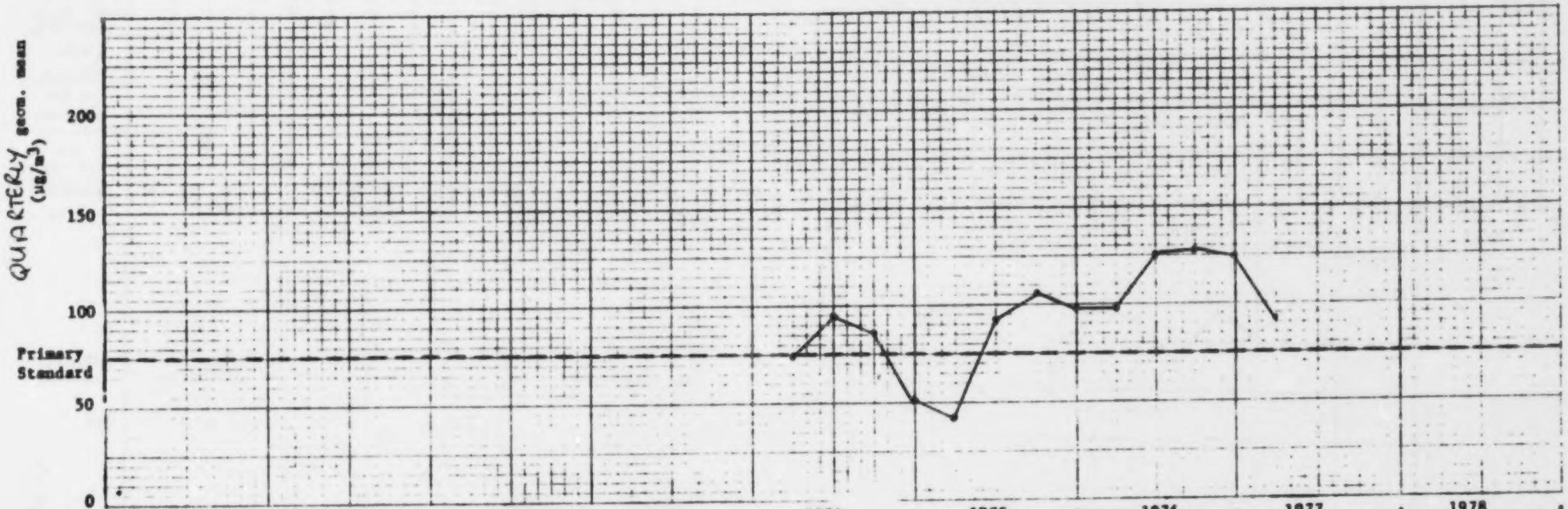


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																	23	23	23	21	20	21	23	23	22	18	23	22	22							
Maximum (ug/m3)																	128	137	95	56	59	311	144	197	210	194	124	82	132							
2nd Max. (ug/m3)																	91	129	91	50	52	182	108	96	167	159	107	60	89							
Quarterly geom. mean (ug/m3)																	40	56	50	30	27	51	70	42	44	72	50	42	39							
No. of Obs >260 ug/m3																	.			.		1	.	.	-	.	-	-	-							
No. of Obs >150 ug/m3																	-			.	.	2	.	1	2	2	-	-	-							

* Value derived from data which do not meet summarization criteria.

Fig 2.1.6.
TSP

Site Location: CRAIg, Colo.
Site Code: 060480001F01



Year Quarter	1970 1	1970 2	1970 3	1970 4	1971 1	1971 2	1971 3	1971 4	1972 1	1972 2	1972 3	1972 4	1973 1	1973 2	1973 3	1973 4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
Quarterly geom. mean (µg/m³)																
No. of Obs >260 µg/m³																
No. of Obs >150 µg/m³																

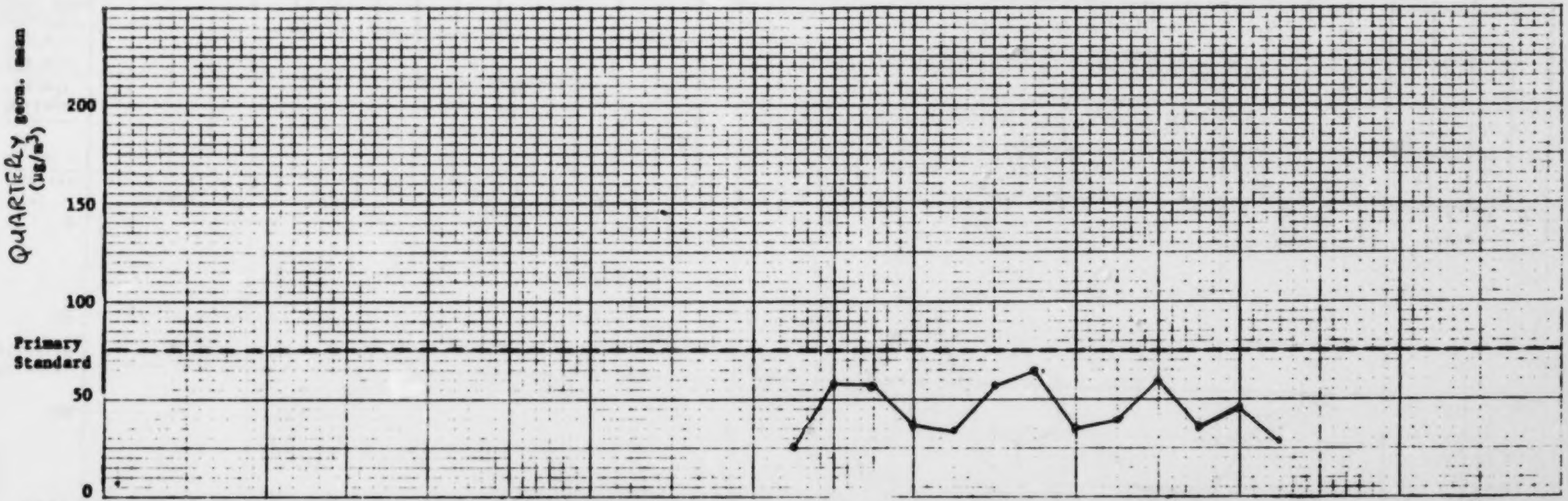
Year Quarter	1974 1	1974 2	1974 3	1974 4	1975 1	1975 2	1975 3	1975 4	1976 1	1976 2	1976 3	1976 4	1977 1	1977 2	1977 3	1977 4	1978 1	1978 2	1978 3	1978 4
No. of Obs.	19	22	21	20	18	16	17	22	20	21	17	22	21							
Maximum (µg/m³)	234	229	152	191	258	184	298	322	296	491	239	270	268							
2nd Max. (µg/m³)	219	190	192	132	190	183	158	310	204	293	182	245	233							
Quarterly geom. mean (µg/m³)	75	94	86	52	93	93	106	92	98	127	128	125	92							
No. of Obs >260 µg/m³								3	·	2	-	1	1							
No. of Obs >150 µg/m³	6	3	1	1	3	3	2	7	6	7	5	11	5							

* Value derived from data which do not meet summarization criteria.

Fig 2.1.7
TSP

Site Location: MEEKER, COLO.

Site Code: 061860001F01



Year	1970				1971				1972				1973			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
Quarterly geom. mean (µg/m³)																
No. of Obs >260 µg/m³																
No. of Obs >150 µg/m³																

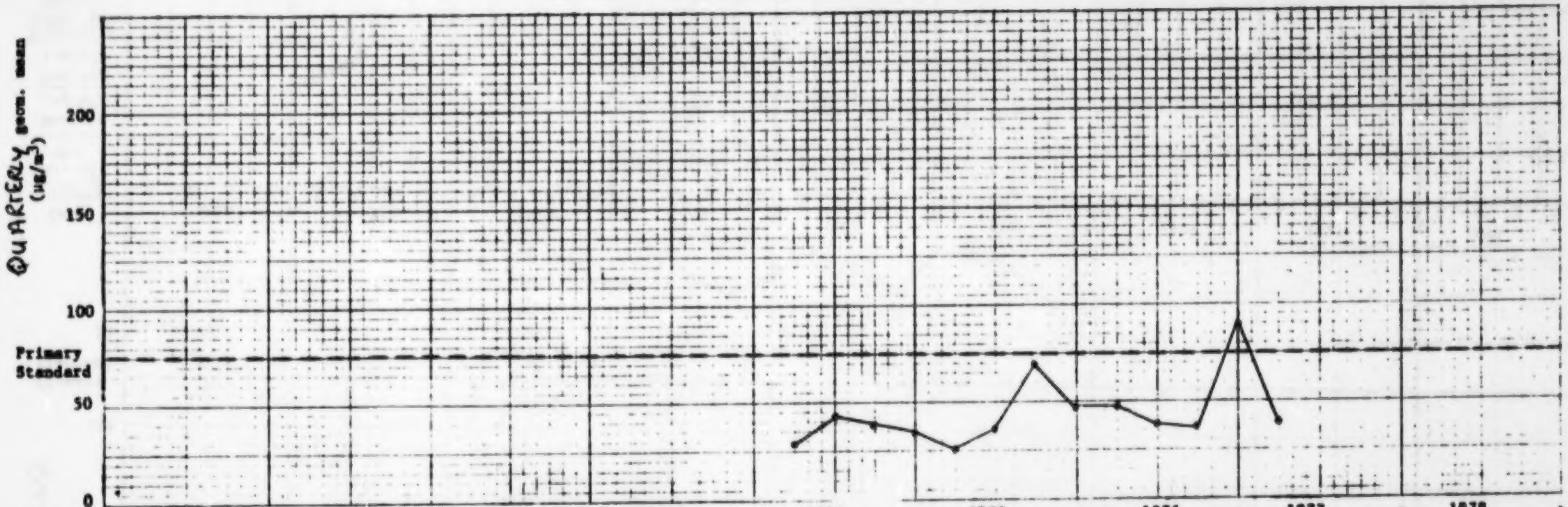
Year	1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.	19	23	15	23	22	15	23	17	20	16	17	23	22							
Maximum (µg/m³)	123	231	107	139	115	127	190	115	117	190	73	116	66							
2nd Max. (µg/m³)	98	186	93	112	68	116	109	89	80	124	72	96	63							
Quarterly geom. mean (µg/m³)	26	59	57	38	35	57	64	36	39	60	37	47	29							
No. of Obs >260 µg/m³	-	-	-	-	-	-	-		-	-	-	-	-							
No. of Obs >150 µg/m³	-	2	-	-	-	-	-		-	1	-	-	-							

* Value derived from data which do not meet summarization criteria.

Fig 2.1.8
TSP

Site Location: Ransely, Colo.

Site Code: 06186 0002 F01

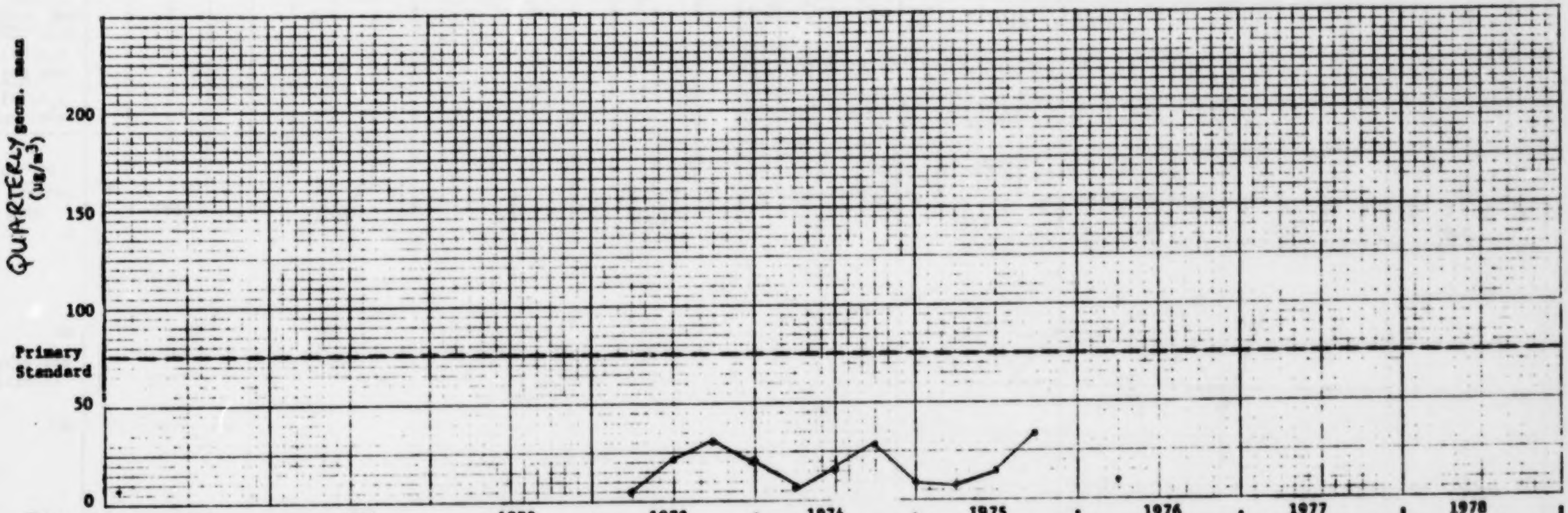


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																	21	23	23	20	21	22	23	23	23	20	22	21	23							
Maximum (µg/m³)																	60	196	89	89	85	88	290	137	92	136	117	205	128							
2nd Max. (µg/m³)																	57	159	80	69	53	82	172	113	82	91	64	168	109							
Quarterly geom. mean (µg/m³)																	29	43	37	39	26	37	70	47	47	38	37	89	41							
No. of Obs >260 µg/m³																							1													
No. of Obs >150 µg/m³																		2					2					5								

* Value derived from data which do not meet summarization criteris.

Fig. 2.1.9.
TSP

Site Location: Black Sulfur Creek, Colo.
Site Code: 06186000 2F03



Year Quarter	1970 1	1970 2	1970 3	1970 4	1971 1	1971 2	1971 3	1971 4	1972 1	1972 2	1972 3	1972 4	1973 1	1973 2	1973 3	1973 4	1974 1	1974 2	1974 3	1974 4	1975 1	1975 2	1975 3	1975 4	1976 1	1976 2	1976 3	1976 4	1977 1	1977 2	1977 3	1977 4	1978 1	1978 2	1978 3	1978 4
No. of Obs.													22	22	23	16	19	23	23	23	22	8	4	-	16											
Maximum (μg/m³)													17	54	69	132	16	111	68	96	33	39	117		33											
2nd Max. (μg/m³)													15	52	65	122	19	67	65	43	20	26	39		19											
Quarterly Geom. mean (μg/m³)													5	22	31	21	7	17	28	9	7	15	34*		10											
No. of Obs >260 μg/m³													-	-	-		-	-	-		-	-	-		-											
No. of Obs >150 μg/m³													-	-	-	-	-	-	-				-		-											

* Value derived from data which do not meet summarization criteria.

SECTION 2.2

MONTANA

Seven of the sites listed in this section were originally established by by PEDCo for the NGPRP study. Of the eight additional sites added to the network 6 have begun to report data. The two additional sites in Daniels County around Scobey (Scobey 1 & 2 which are funded as part of the Poplar River Study) have not reported data as of the first quarter of 1977. While the total number of sites funded by OEA in Montana remains the same, 15, in FY '78 as in FY '77, several changes have occurred in the network. The sites at Miles City and Ekalaka are to be moved to Otter Creek and Quietus areas, which are closer to mining activity. A site will also be established at Red Lodge. The second sampler at the dual Lindsay site will be used as equipment for the Red Lodge site. The fate of the site at Poplar is unknown at this time. When the first unit of the power plant at Colstrip started operation in 1975 the status of the BN and Macrae Colstrip monitoring sites changed from baseline monitors to source oriented monitors. Several quarters of data are missing from the Colstrip, Decker, Ekalaka, Lame Deer, and Scobey sites. These data gaps were caused by some data or equipment failure at the state level.

Total Suspended Particulate

All sites funded by OEA are to monitor for total suspended particulate. During the period of monitoring, which included almost 3 years of data for some sites, single violations of short term secondary standards have been recorded at Ft. Peck and Poplar sites. Multiple violations of the short term secondary standard have been reported standard have been reported at the Decker site. The third quarter 1976 had a geometric quarterly mean of 86 ug/m^3 estimated annual geometric mean for 1976 was 61 ug/m^3. Possible excursions of the annual TSP standard could occur at the Decker sampling location.

Sulfur Dioxide

Five OEA funded sites report SO$_2$ data. Annual arithmetic mean values have been below 5 ug/m^3. The continuous monitors at Colstrip consistently record 3 ug/m^3 for quarterly arithmetic averages.

Nitrogen Dioxide

Five OEA funded sites monitor and report NO$_x$ data. Values usually run below 10 ug/m^3. The quarterly arithmetic mean for the bubbler at Ft. Peck recorded 19 ug/m^3 NO$_x$ during the 1st Quarter 1976. This high a value is unusual even for Ft. Peck whose monitors have averaged much less than 10 ug/m^3 since sampling started at this site in 1974.

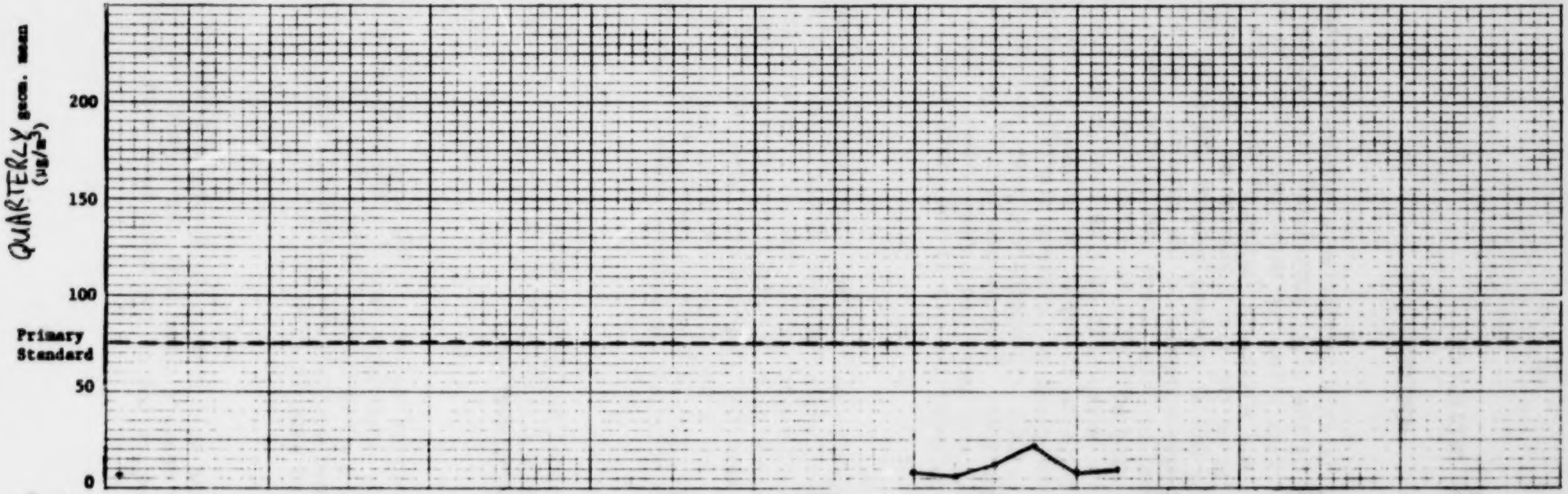
Ozone

Ozone was measured at the Wolf Point site during a summer study in 1975. The Colstrip sites currently measure ozone with the highest recorded one hour value being 157 ug/m^3. No excursions of the NAAQS have been recorded.

TSP Fig 2.2.1.

Site Location: EKALAKA, MT

Site Code: 270200001F03



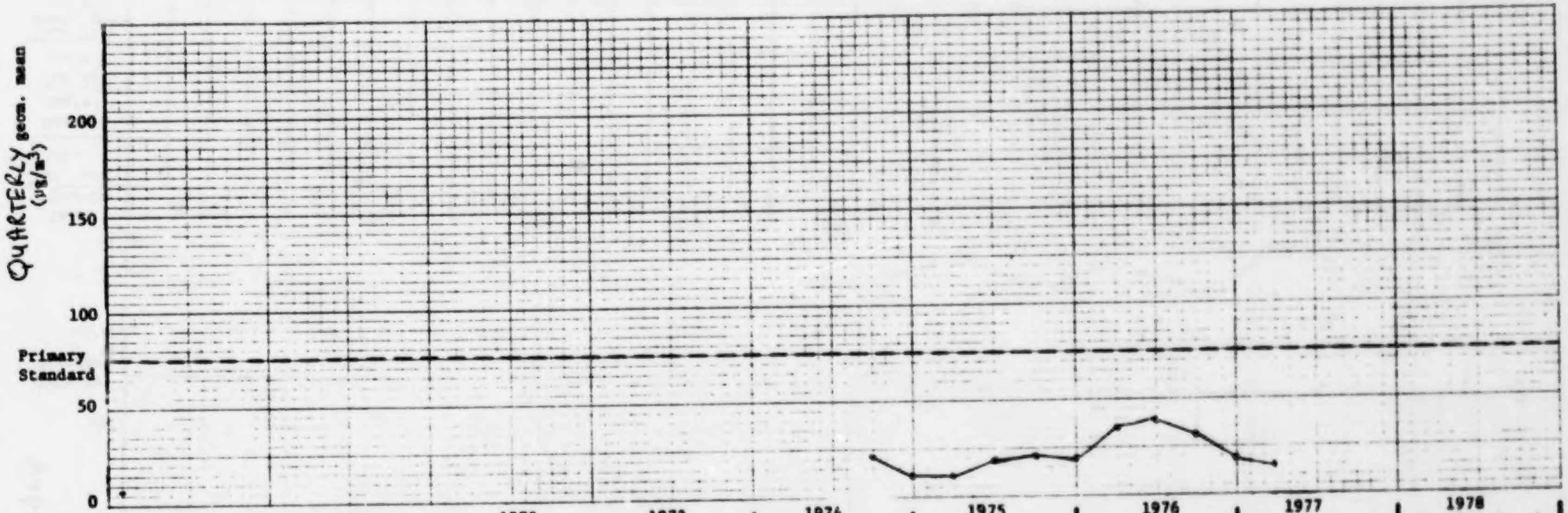
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				15	13	12	5	7	1	0	0	0								
Maximum (μg/m³)																				37	10	39	32	13	11											
2nd Max. (μg/m³)																				26	9	16	31	10	-											
Quarterly Geom. mean (μg/m³)																				8	6	11	*23	7	-											
No. of Obs >260 μg/m³																				.		-	-	-	-											
No. of Obs >150 μg/m³																				-		-	-	-	-											

* Value derived from data which do not meet summarization criteria.

TSP Fig 2.2.2.

Site Location: GLENDIVE, MT

Site Code: 270360001F03



Year	1970				1971				1972			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.												
Maximum (µg/m³)												
2nd Max. (µg/m³)												
Quarterly geom. mean (µg/m³)												
No. of Obs >260 µg/m³												
No. of Obs >150 µg/m³												

Year	1973				1974				1975			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.							4	14	13	10	5	4
Maximum (µg/m³)							49	45	59	33	35	130
2nd Max. (µg/m³)							29	32	57	31	29	14
Quarterly geom. mean (µg/m³)							22*	12	12	20	21*	19*
No. of Obs >260 µg/m³												
No. of Obs >150 µg/m³												

Year	1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.	7	9	10	13	3							
Maximum (µg/m³)	82	99	44	102	19							
2nd Max. (µg/m³)	44	52	40	35	18							
Quarterly geom. mean (µg/m³)	35	37	30	18	15							
No. of Obs >260 µg/m³												
No. of Obs >150 µg/m³												

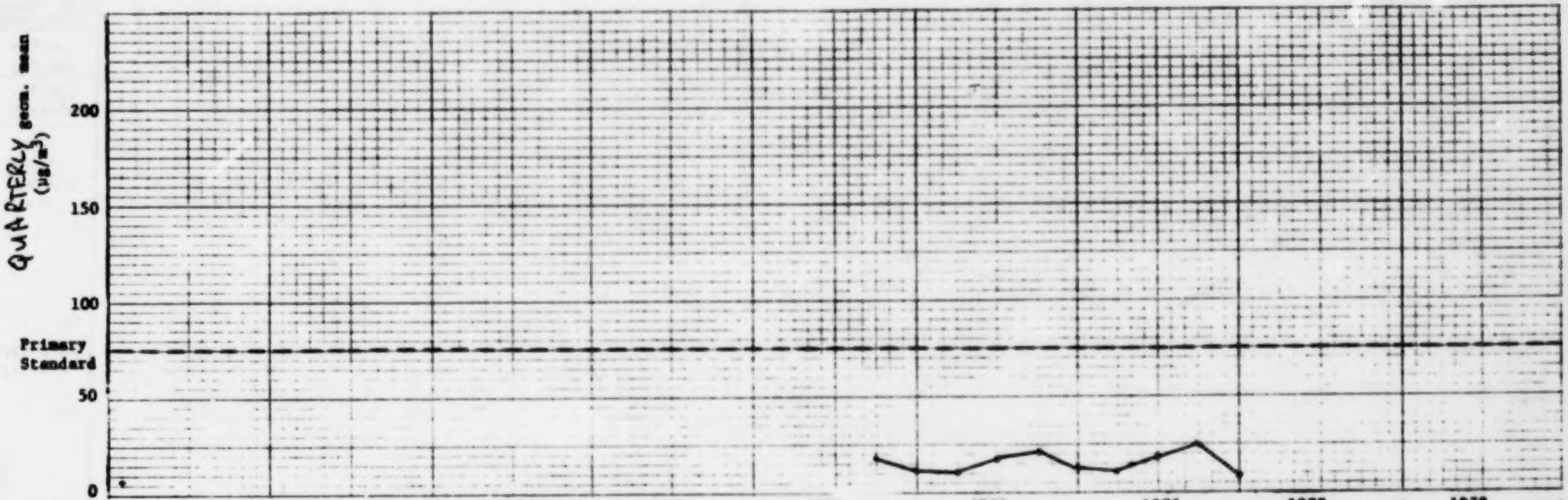
No. of obs/yr.

* Value derived from data which do not meet summarization criteria.

Fig 2.2.3.1.
TSP
(DUAL SITE)

Site Location: Lincoln, ½ MT

Site Code: 27036007F03



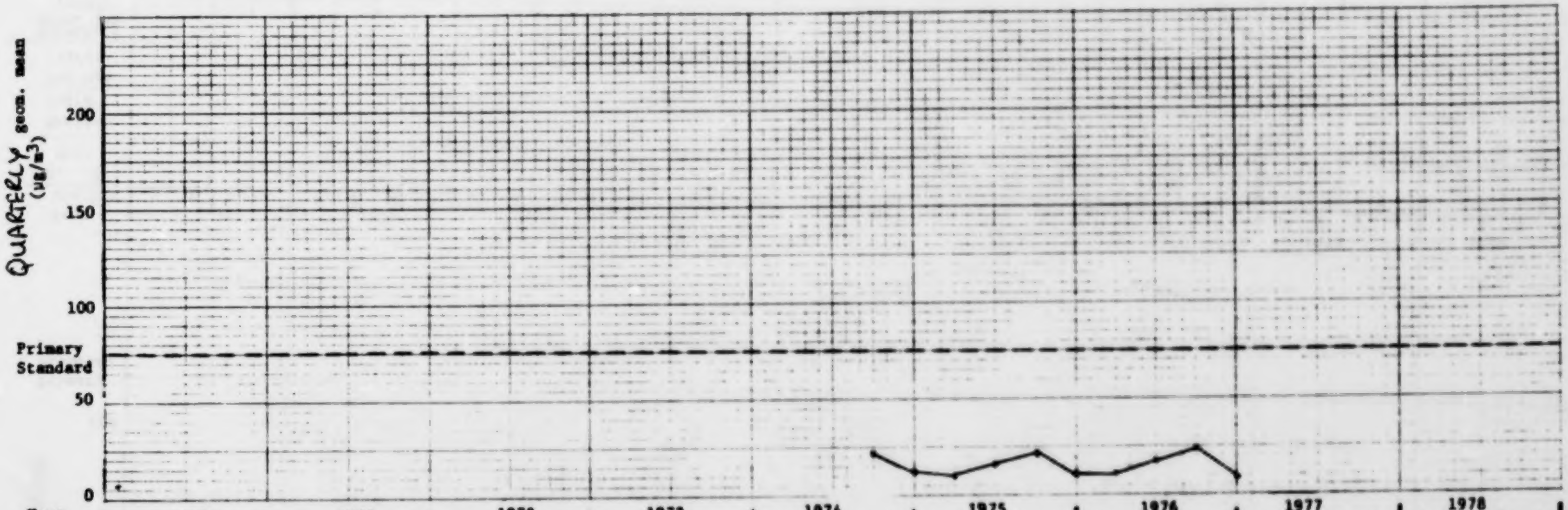
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			5	16	13	14	14	6	11	6	8	8								
Maximum (µg/m³)																			70	51	27	29	86	29	30	38	36	25								
2nd Max. (µg/m³)																			23	31	25	23	34	15	22	39	30	16								
Quarterly geom. mean (µg/m³)																			17	12	11	16	21	11	9	18	25	8								
No. of Obs >260 µg/m³																																				
No. of Obs >150 µg/m³																																				
No. of Obs/yr.																								15				33								

* Value derived from data which do not meet summarization criteria.

Fig 2.2.3.2
TSP
(DUAL SITE)

Site Location: LINDSAY, MT.

Site Code: 270360003F03

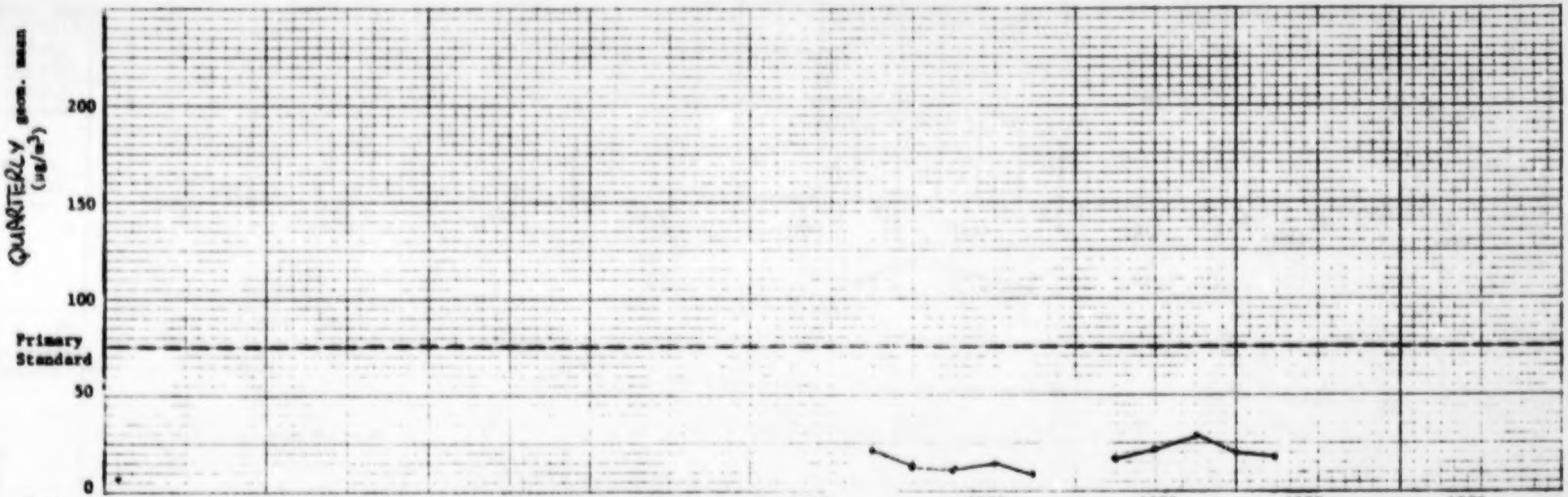


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			4	16	19	19	14	6	11	12	7	4								
Maximum (µg/m3)																			74	50	29	27	32	28	60	42	32	14								
2nd Max. (µg/m3)																			25	31	23	26	41	15	32	40	29	11								
Quarterly geom. mean (µg/m3)																			22	12	9	16	22	10	12	17	24	9*								
No. of Obs >260 µg/m3																																				
No. of Obs >150 µg/m3																																				
No. of obs/yr.																								47				31								

*Value derived from data which do not meet summarization criteria

Fig. 2.2.A.1.
TSP

Site Location: Ft. Peck, Mt
Site Code: 290380001F02



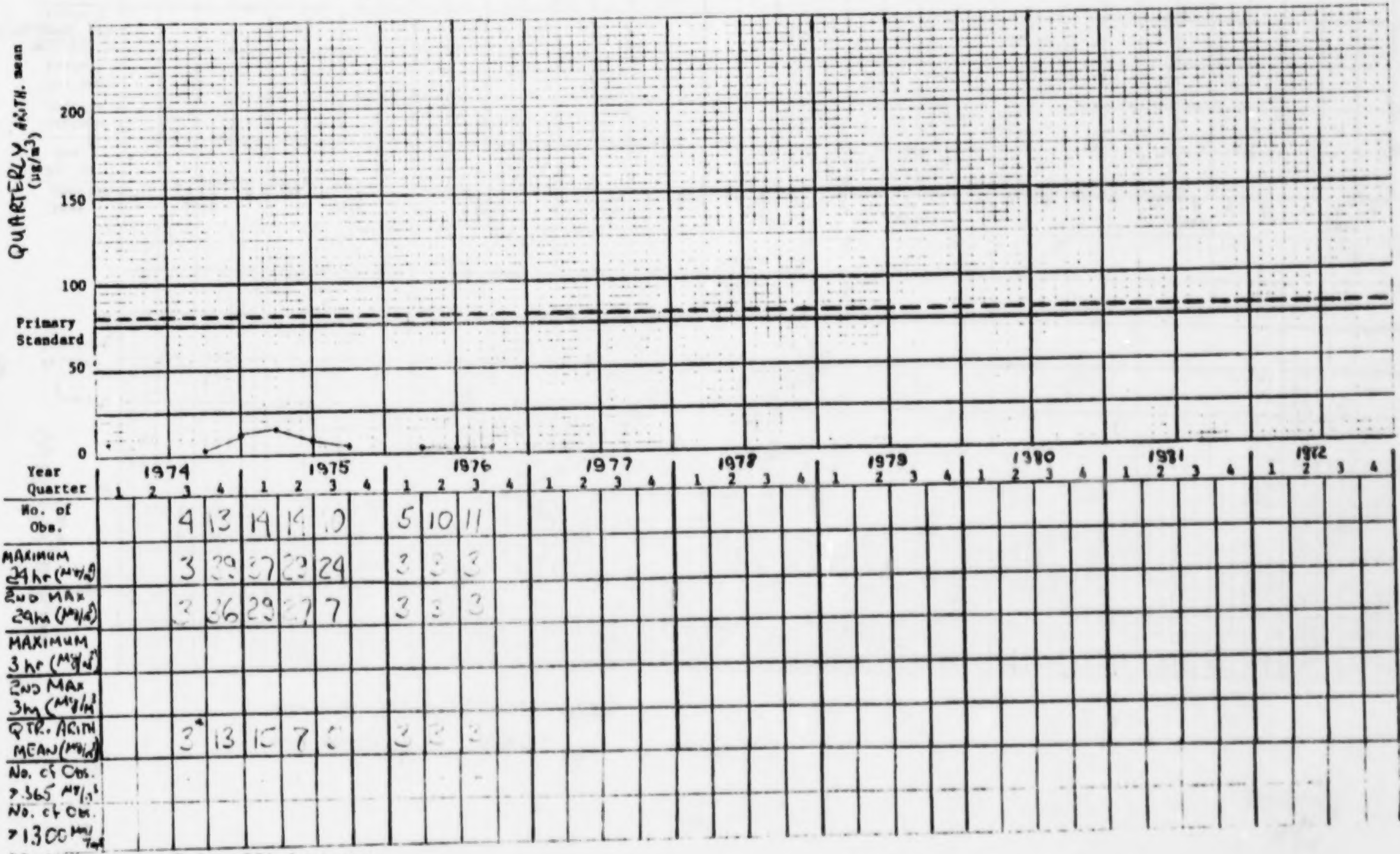
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			3	15	13	12	12	1	9	10	9	8	6							
Maximum (ug/m³)																			51	40	27	25	26	34	166	47	60	91	90							
2nd Max. (ug/m³)																			37	34	17	13	16	·	77	39	57	30	28							
Quarterly geom. mean (ug/m³)																			22	11	9	12	6	·	17	22	28	18	17							
No. of Obs >260 ug/m³																																				
No. of Obs >150 ug/m³																									1											
No. of Obs/yr.																								38			36									

* Value derived from data which do not meet summarization criteria.

Fig 2.2.4.2.
SO_2
BUBBLER

Site Location: [illegible]

Site Code: 27[illegible]



Year	1974				1975				1976				1977			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			4	13	19	14	10		5	10	11					
MAXIMUM 24hr (μg/m³)			3	29	37	23	24		3	3	3					
2ND MAX 24hr (μg/m³)			3	36	29	27	7		3	3	3					
MAXIMUM 3hr (μg/m³)																
2ND MAX 3hr (μg/m³)																
QTR. ARITH MEAN (μg/m³)			3*	13	15	7	5		3	3	3					
No. of Obs. > 365 μg/m³																
No. of Obs. > 1300 μg/m³																

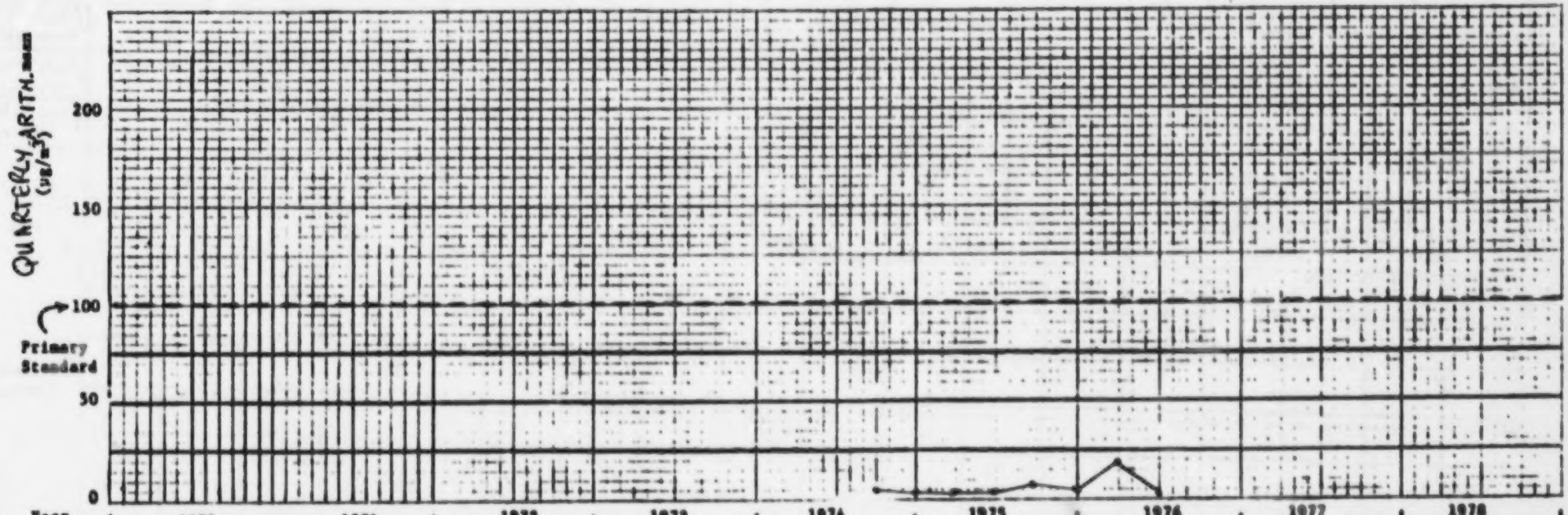
Year	1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				
MAXIMUM 24hr (μg/m³)																				
2ND MAX 24hr (μg/m³)																				
MAXIMUM 3hr (μg/m³)																				
2ND MAX 3hr (μg/m³)																				
QTR. ARITH MEAN (μg/m³)																				
No. of Obs. > 365 μg/m³																				
No. of Obs. > 1300 μg/m³																				

* Estimates of insufficient data.

Fig 2,2.4.3.
NO$_2$
BUBBLER

Site Location: FT. PECK, MT.

Site Code: 270980001F03



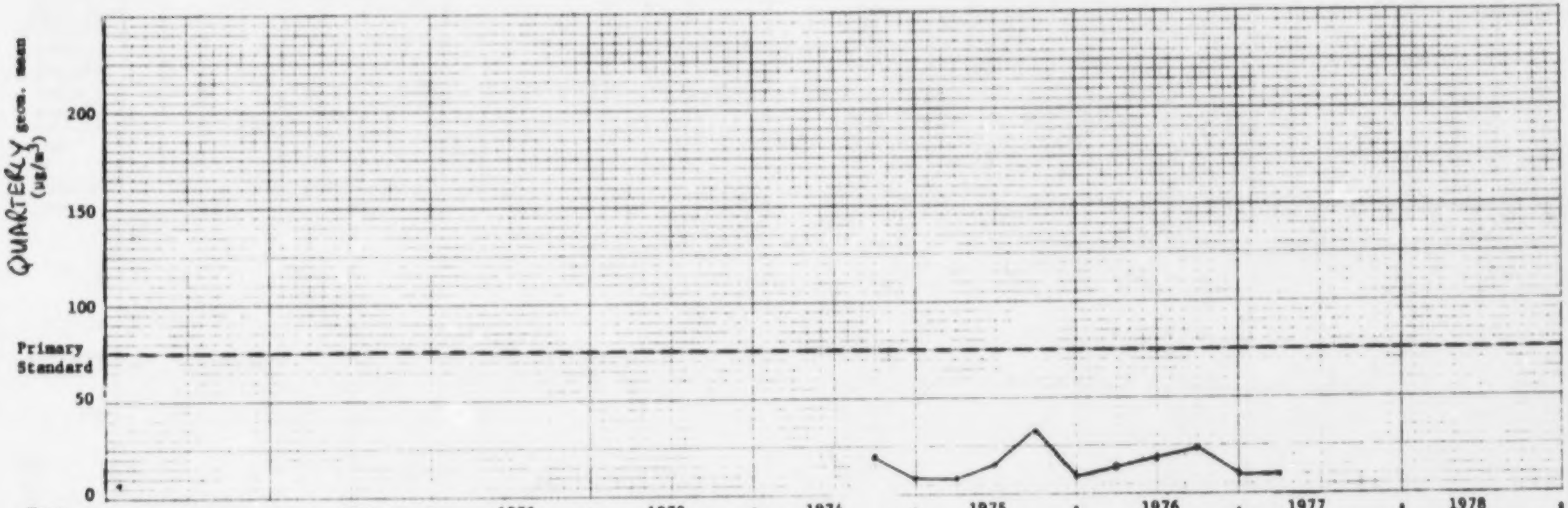
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			4	12	14	13	10	6	11	10										
Maximum (ug/m^3)																			8	3	3	8	19	11	160	3										
2nd Max. (ug/m^3)																			3	3	3	6	15	6	15	3										
ARITH. Quarterly ~~geom.~~ mean (ug/m^3)																			4*	3	3	3	8	5	19	3										
No. of Obs >200 ug/m^3																																				
No. of Obs >100 ug/m^3																																				

* Value derived from Data which do not meet summarization criteria.

Fig. 2.2.5.
TSP

Site Location: [illegible]

Site Code: [illegible]



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			3	15	15	14	15	15	13	15	15	15	13							
Maximum (ug/m3)																			38	53	26	27	66	26	24	48	49	62	51							
2nd Max. (ug/m3)																			13	26	25	22	47	16	19	40	45	27	45							
Quarterly Geom. mean (ug/m3)																			18	8	8	12	31	8	19	40	26	11	10							
No. of Obs >260 ug/m3																																				
No. of Obs >150 ug/m3																																				

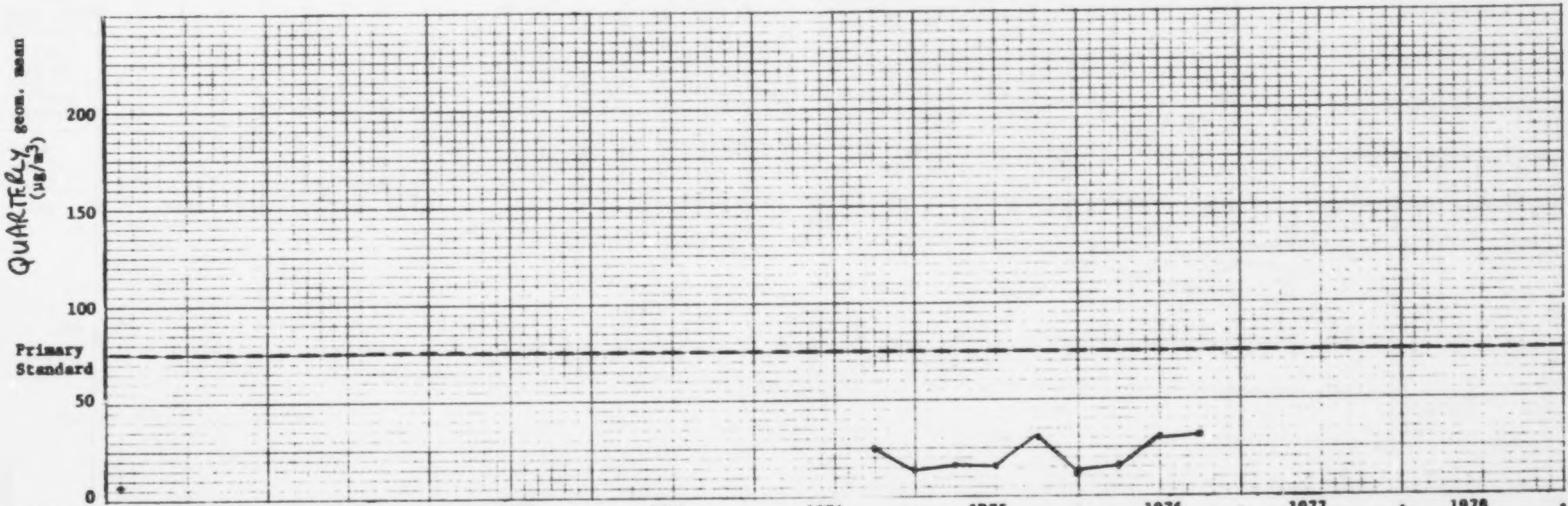
No. of Obs/yr. [illegible] 58

* Value derived from data which do not meet summarization criteria.

Fig 2.2.6.1.
TSP

Site Location: Wolf Point, Mt. (Poplar)

Site Code: 271340001F03

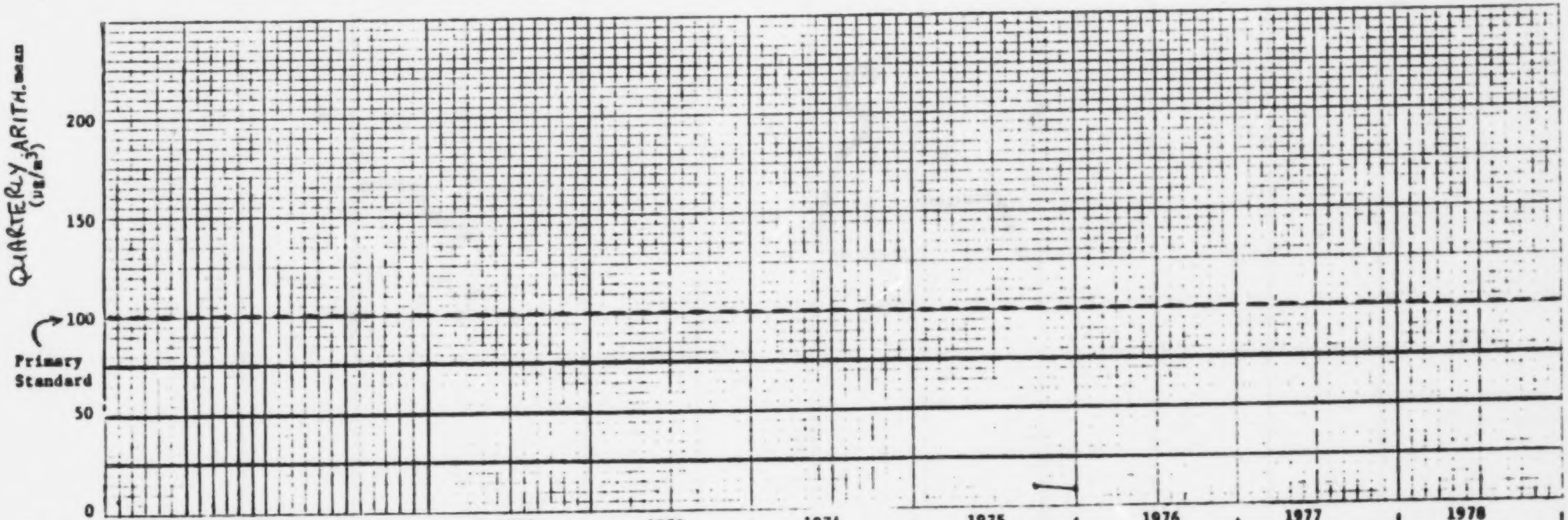


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			5	15	15	14	19	15	16	14	12	1								
Maximum (µg/m³)																			40	60	124	32	71	69	132	173	59	82								
2nd Max. (µg/m³)																			29	38	57	29	69	39	65	53	54	-								
Quarterly geom. mean (µg/m³)																			25*	14	16	14	29	10	17	29	32	82*								
No. of Obs >260 µg/m³																			-						-		-									
No. of Obs >150 µg/m³																			-							1	-									
No. of Obs/yr.																								[illegible]				43								

* Value derived from data which do not meet summarization criteria.

Fig. 2.2.6.2.
NO$_2$
CONTINOU:

Site Location: WOLF POINT, MT. (POPLAR)
Site Code: 271340001F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																							2028	9												
Maximum (µg/m³)																							38	9												
2nd Max. (µg/m³)																							19	9												
ARITH. Quarterly mean (µg/m³)																							10	9*												
No. of Obs >200 µg/m³																							-	-												
No. of Obs >100 µg/m³																							-	-												

*Value derived from data which do not meet summarization criteria.

OZONE DATA

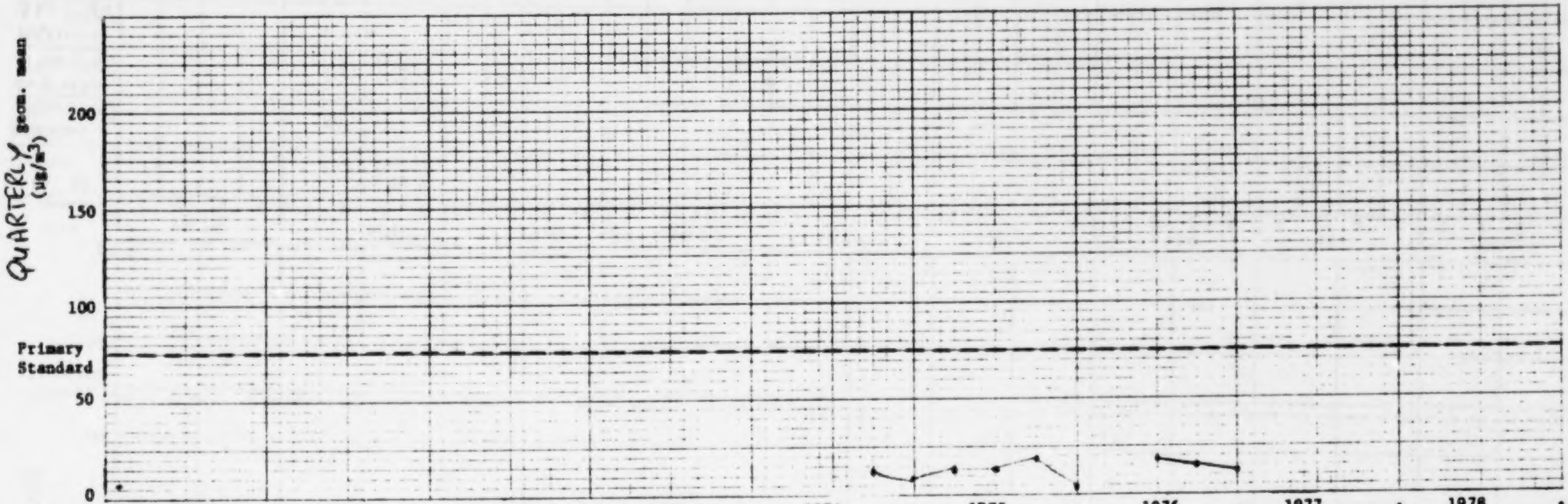
TABLE 2.2.6.

SITE	QTR	MAX	2ND MAX	ANN ARITH MEAN	ANN GEO. MEAN	OBS
Wolf Point, MT. (continued)	74-03	131	129	58	57	2036
	74-09	24	22	16*	15	9

Fig 2.2.7.1.
TSP

Site Location: LAME DEER, MT.

Site Code: 271360003F03



Year	1970				1971				1972				1973			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																
Maximum ($\mu g/m^3$)																
2nd Max. ($\mu g/m^3$)																
Quarterly geom. mean ($\mu g/m^3$)																
No. of Obs >260 $\mu g/m^3$																
No. of Obs >150 $\mu g/m^3$																

Year	1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			3	14	3	5	14	7	0	9	11	3								
Maximum ($\mu g/m^3$)			23	19	99	18	31	14		37	131	23								
2nd Max. ($\mu g/m^3$)			10	15	8	14	28	10		23	30	16								
Quarterly geom. mean ($\mu g/m^3$)			12*	8	12*	13*	18	4		17*	16	13*								
No. of Obs >260 $\mu g/m^3$																				
No. of Obs >150 $\mu g/m^3$																				

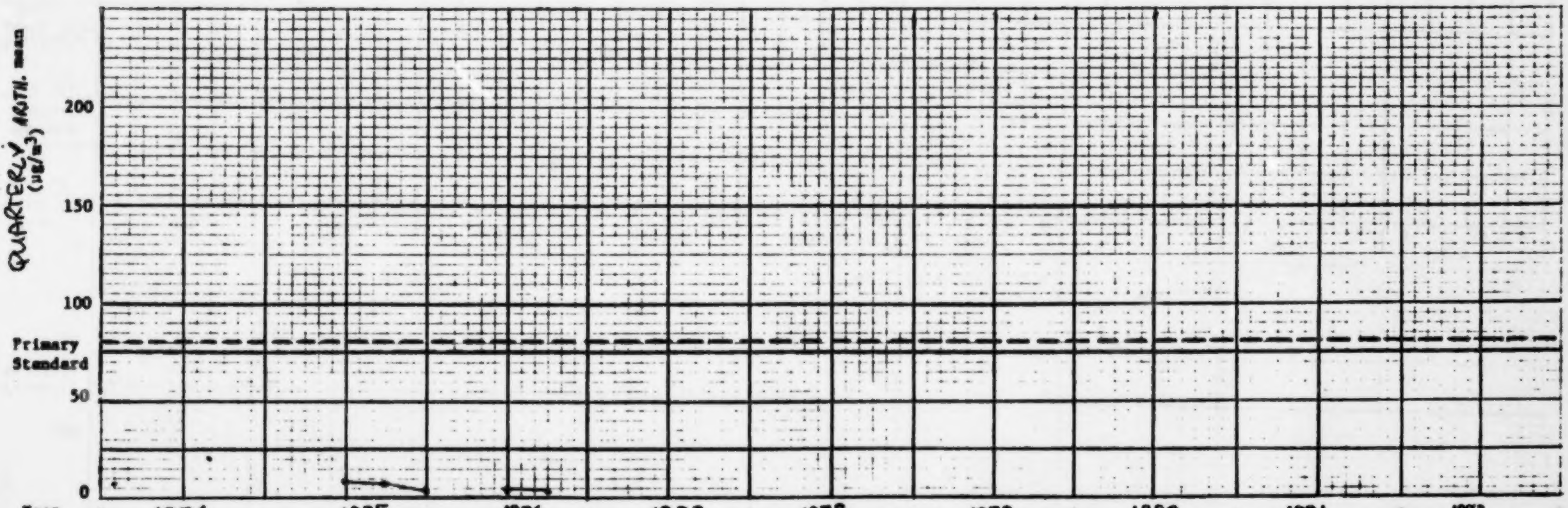
No. of Obs/yr.

*Value derived from data which do not meet summarization criteria.

Fig 2.2.7.i
SO_2
BUBBLER

Site Location: LAME DEER, MT.

Site Code: 27136000 3F03

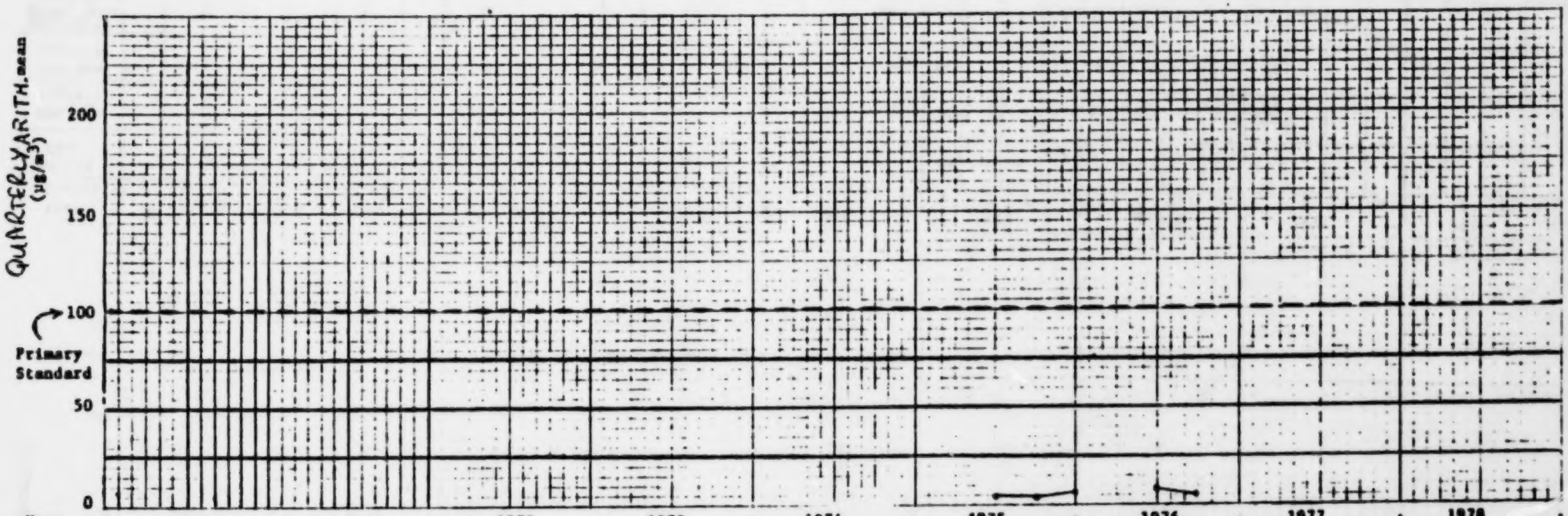


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.						5	12	5		7	12																									
MAXIMUM 24 hr (μg/m³)						19	18	3		3	3																									
2ND MAX 24 hr (μg/m³)						10	13	3		3	3																									
MAXIMUM 3 hr (μg/m³)																																				
2ND MAX 3 hr (μg/m³)																																				
QTR. ARITH MEAN (μg/m³)						9*	7	3*		3	3																									
No. of Obs. >365 μg/m³																																				
No. of Obs. >1300 μg/m³									-																											

*Value derived from data which do not meet summarization criteria.

Fig 2.2.7.3
NO$_2$
bubbler

Site Location: Lame Deer, Mt.
Site Code: 271360003F03

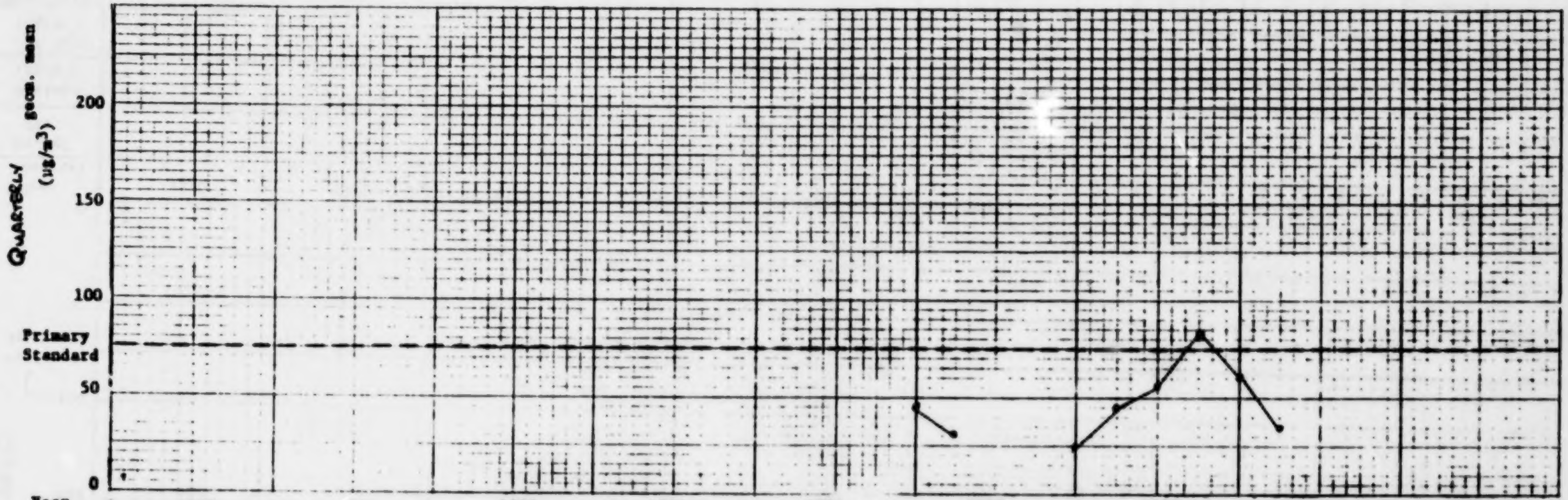


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																						5	12	5	-	6	12									
Maximum (μg/m³)																						6	11	11		21	13									
2nd Max. (μg/m³)																						5	7	6		9	8									
ARITH. Quarterly mean (μg/m³)																						4*	4	6*		8	5									
No. of Obs >200 μg/m³																																				
No. of Obs >100 μg/m³																																				

* Value derived from data which do not meet summarization criteria.

Fig 2. 2.8
TSP

Site Location: DECKER, MT (MORTON RESIDENCE)
Site Code: 270060009F03



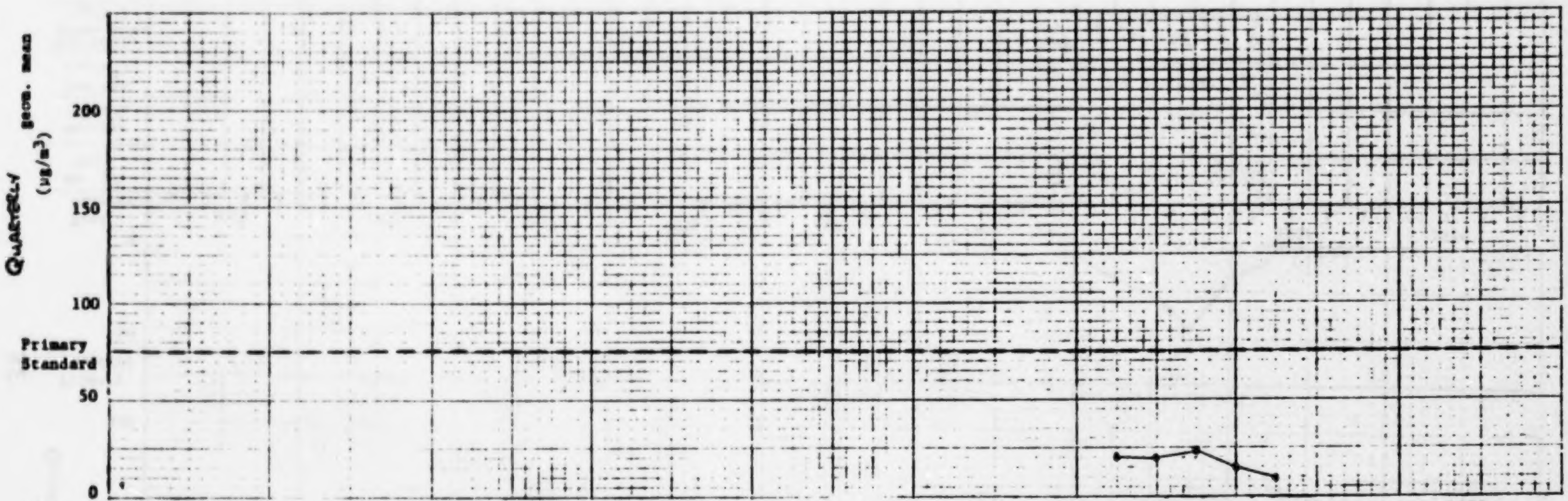
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				15	7	-	-	6	11	19	13	14	19							
Maximum (µg/m³)																				160	77			255	197	206	202	132	198							
2nd Max. (µg/m³)																				102	77			18	185	178	162	129	58							
Quarterly geom. mean (µg/m³)																				45	31			25	45	56	84	60	35							
No. of Obs >260 µg/m³																				-	-			-	.	.	.	-	-							
No. of Obs >150 µg/m³																				1	.			1	2	3	2	.	.							

* Value derived from data which do not meet summarization criteria.

Fig 2. 2. 9.
TSP

Site Location: Miles City, Mt

Site Code: 270300004F03

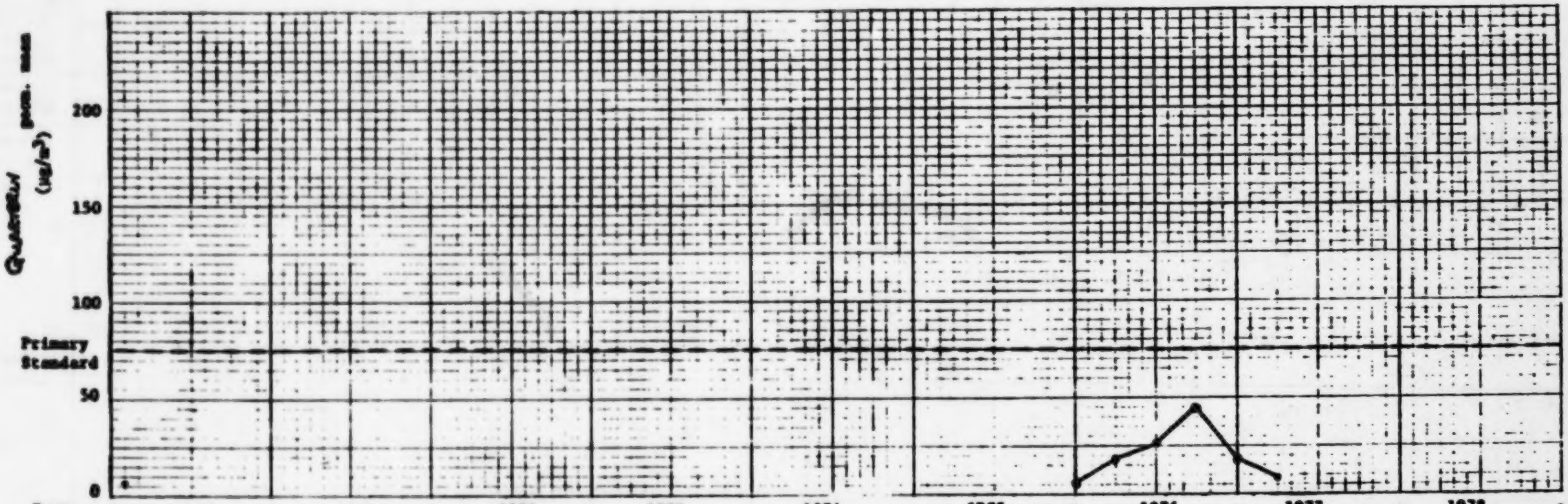


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																									12	10	6	13	7							
Maximum (µg/m³)																									85	87	91	50	27							
2nd Max. (µg/m³)																									75	43	35	49	13							
Quarterly geom. mean (µg/m³)																									21	20	29	15	10							
No. of Obs >260 µg/m³																									-	-	-	-	-							
No. of Obs >150 µg/m³																									-	-	-	-	-							

* Value derived from data which do not meet summarization criteria.

Fig. 2.2.10
TSP

Site Location: HARDIN, MONTANA (WARREN RANCH)
Site Code: 270060010F03

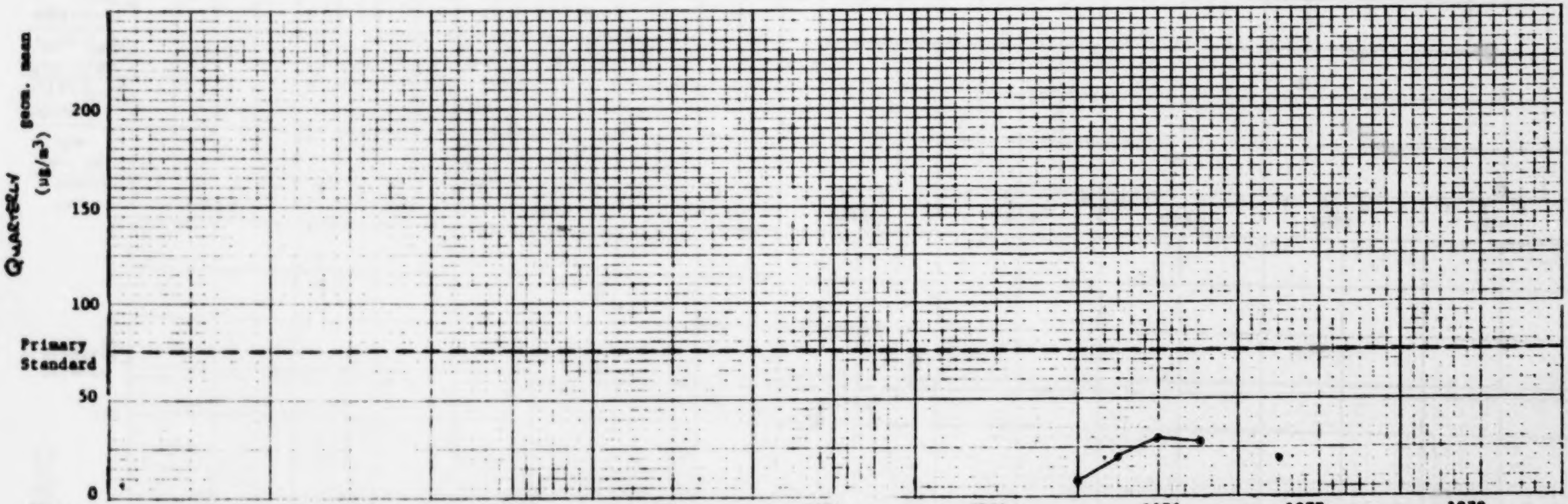


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																								4	15	13	13	14	14							
Maximum (µg/m³)																								7	85	79	196	36	15							
2nd Max. (µg/m³)																								6	67	62	98	33	15							
Quarterly Geom. Mean (µg/m³)																								5*	18	26	44	18	8							
No. of Obs >260 µg/m³																								-	-	-	-	-	-							
No. of Obs >150 µg/m³																								-	-	-	-	-	-							

* Value derived from data which do not meet summarization criteria.

Fig. 2.2.11.1
TSP

Site Location: Scobey-3, MT
Site Code: 270390001F03



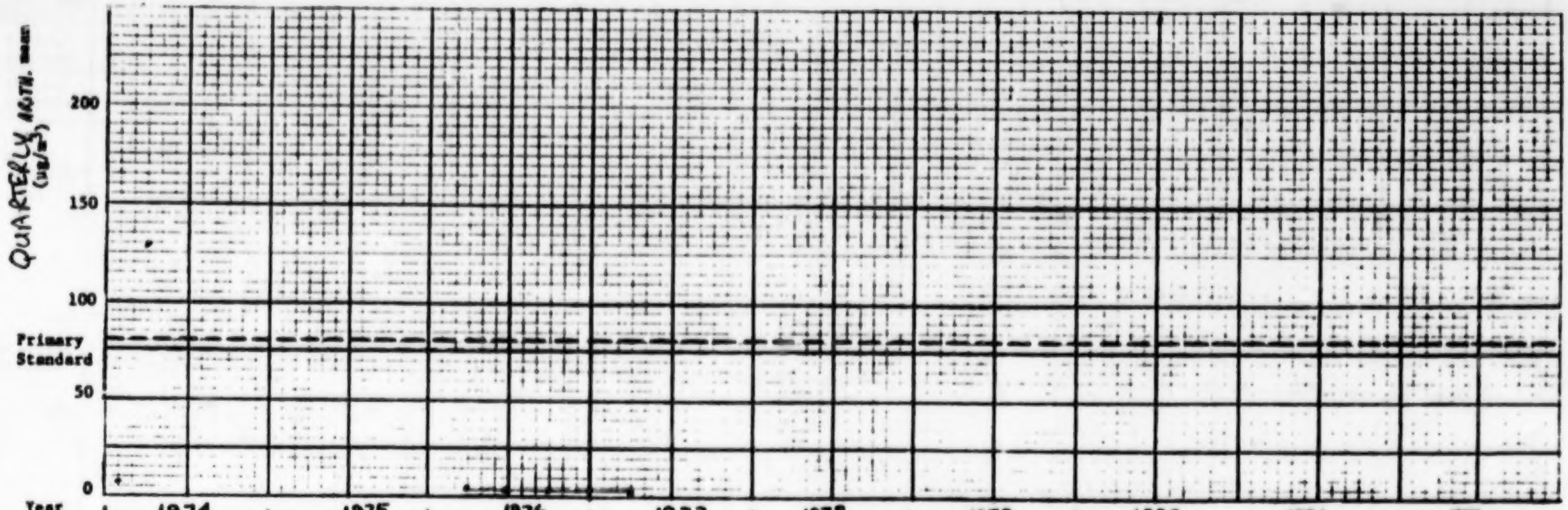
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																								2	4	13	9		4							
Maximum (ug/m3)																								9	46	98	49		54							
2nd Max. (ug/m3)																								6	41	86	46		24							
Quarterly geom. mean (ug/m3)																								7*	21*	30	28		20*							
No. of Obs >260 ug/m3																																				
No. of Obs >150 ug/m3																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.2.11.2
SO_2
bubbler

Site Location: SCOBEY-3, MT.

Site Code: 270390001F03



Year	1974				1975				1976				1977			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.									2	13	8	2	2			
MAXIMUM 24 hr (Mg/m³)									3	3	3	3	3			
2ND MAX 24hr (Mg/m³)									3	3	3	3	3			
MAXIMUM 3 hr (Mg/m³)																
2ND MAX 3hr (Mg/m³)																
QTR. ARITH MEAN (Mg/m³)									3	3	3	3	3			
No. of Obs. >365 Mg/m³																
No. of Obs. >1300 Mg/m³																

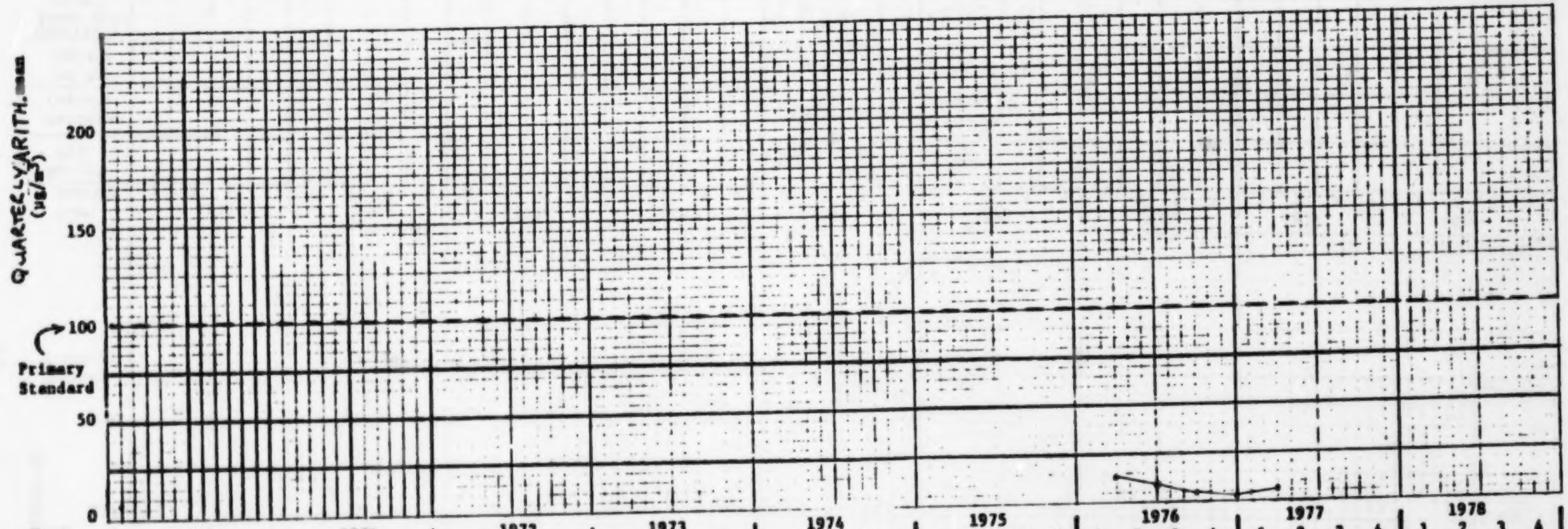
Year	1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				
MAXIMUM 24 hr (Mg/m³)																				
2ND MAX 24hr (Mg/m³)																				
MAXIMUM 3 hr (Mg/m³)																				
2ND MAX 3hr (Mg/m³)																				
QTR. ARITH MEAN (Mg/m³)																				
No. of Obs. >365 Mg/m³																				
No. of Obs. >1300 Mg/m³																				

Fig 2.2.11.3

NO₂

Site Location: Seeley-3, MT

Site Code: 27034 0001 F03



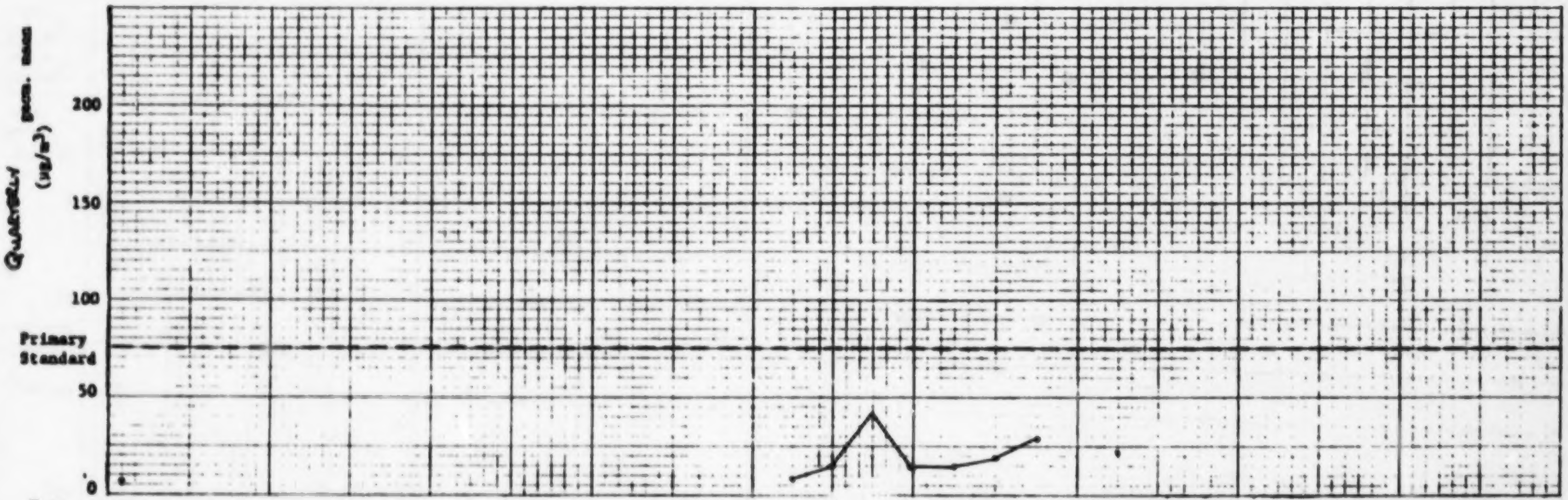
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																									4	13	13	2	2							
Maximum (μg/m³)																									26	28	15	3	9							
2nd Max. (μg/m³)																									15	15	9	3	3							
Quarterly ARITH. mean (μg/m³)																									14*	9	5	3*	6*							
No. of Obs >200 μg/m³																																				
No. of Obs >100 μg/m³																																				

* Value derived from data which do not meet summarization criteria.

41

Fig. 2.2.12.1
TSP

Site Location: COLSTRIP, MT. (BN SITE)
Site Code: 271360027F03



Year	1970				1971				1972				1973				1974			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																	30	30	11	18
Maximum (µg/m³)																	39	54	119	43
2nd Max. (µg/m³)																	26	42	57	39
Quarterly geom. mean (µg/m³)																	8	15	41*	14
No. of Obs >260 µg/m³																				
No. of Obs >150 µg/m³																				

Year	1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.	30	30	7	-	18											
Maximum (µg/m³)	73	65	50		72											
2nd Max. (µg/m³)	67	48	44		71											
Quarterly geom. mean (µg/m³)	15	19	29*		23											
No. of Obs >260 µg/m³																
No. of Obs >150 µg/m³																

* Value derived from data which do not meet summarization criteria.

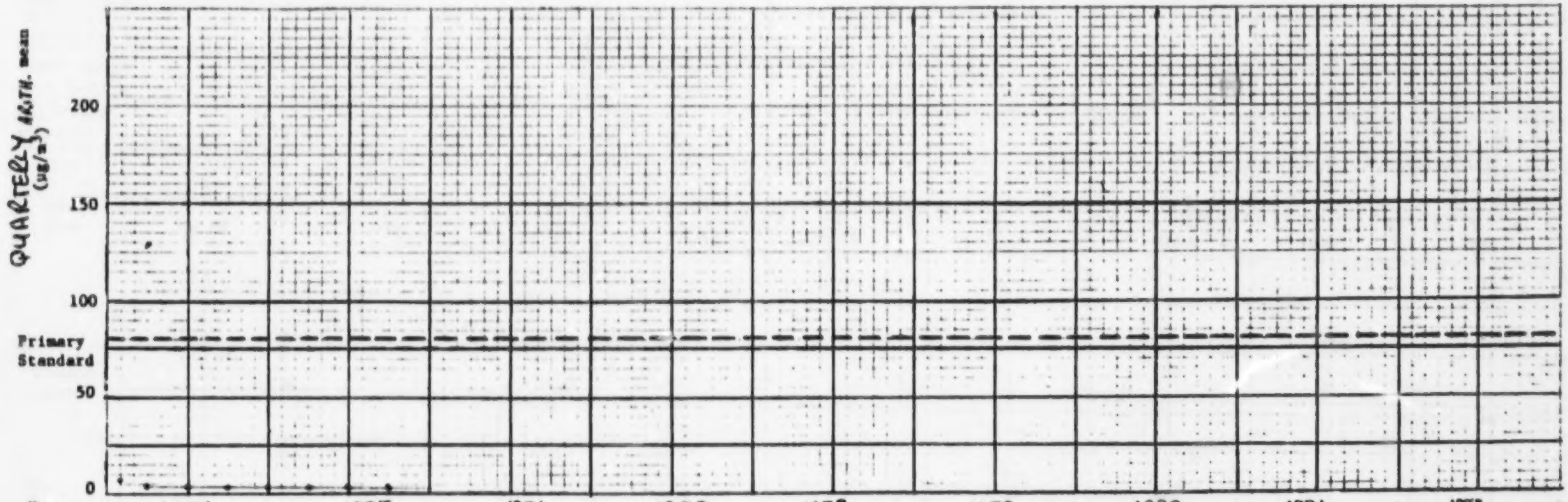
Fig 2.2.12.2

SO_2

bubbler

Site Location: Colstrip, MT (BN Site)

Site Code: 2713600 27F02



Year	1974				1975				1976			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.	77	63	63	33	63	20	58					
MAXIMUM 24 hr (µg/m³)	3	3	3	3	3	3	3					
2ND MAX 24 hr (µg/m³)	3	3	3	3	3	3	3					
MAXIMUM 3 hr (µg/m³)												
2ND MAX 3 hr (µg/m³)												
QTR. ARITH MEAN (µg/m³)	3	3	3	3	3	3*	3					
No. of Obs. >365 µg/m³												
No. of Obs. >1300 µg/m³												

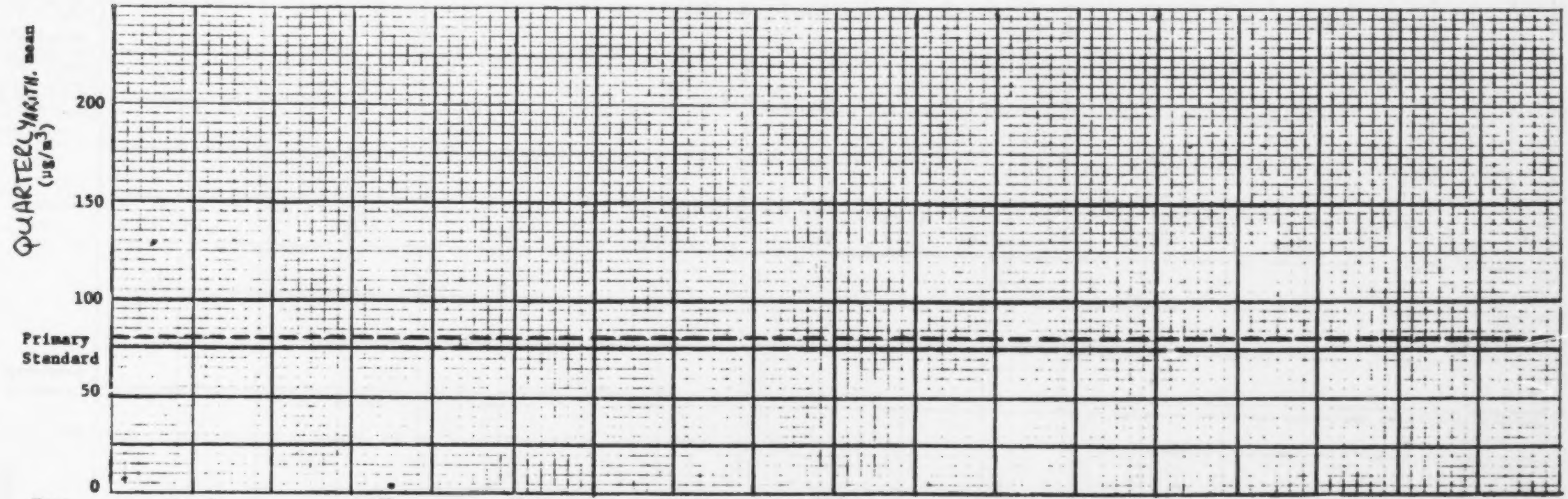
Year	1977				1978				1979			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.												
MAXIMUM 24 hr (µg/m³)												
2ND MAX 24 hr (µg/m³)												
MAXIMUM 3 hr (µg/m³)												
2ND MAX 3 hr (µg/m³)												
QTR. ARITH MEAN (µg/m³)												
No. of Obs. >365 µg/m³												
No. of Obs. >1300 µg/m³												

Year	1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.												
MAXIMUM 24 hr (µg/m³)												
2ND MAX 24 hr (µg/m³)												
MAXIMUM 3 hr (µg/m³)												
2ND MAX 3 hr (µg/m³)												
QTR. ARITH MEAN (µg/m³)												
No. of Obs. >365 µg/m³												
No. of Obs. >1300 µg/m³												

* Value derived from data which do not meet summarization criteria.

2.2.12.3
SO_2
CONTINOUS

Site Location: COLSTRIP, MT. (BN SITE)
Site Code: 27136 00 27F03



Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.							694																													
MAXIMUM 24 hr (Mg/m³)							3																													
2ND MAX 24hr (Mg/m³)							3																													
MAXIMUM 3 hr (Mg/m³)							3																													
2ND MAX 3hr (Mg/m³)							3																													
QTR. ARITH MEAN (Mg/m³)							3																													
No. of Obs. >.365 Mg/m³																																				
No. of Obs. >1300 Mg/m³																																				

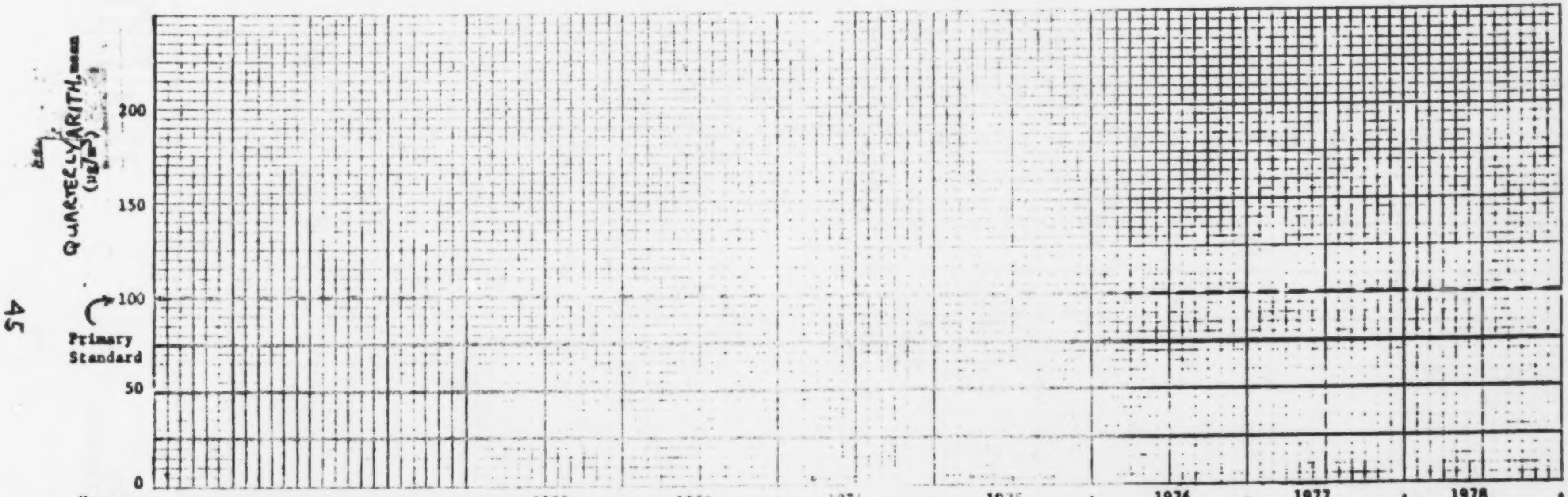
2.2.12.4

NO₂

bubbler

Site Location: Cologne, Mn. ([illegible])

Site Code: 2713[illegible]



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																	[illegible]	[illegible]			[illegible]		[illegible]													
Maximum (µg/m³)																	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]													
2nd Max. (µg/m³)																	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]													
Quarterly ARITH. mean (µg/m³)																	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]													
No. of Obs >200 µg/m³																																				
No. of Obs >100 µg/m³																																				

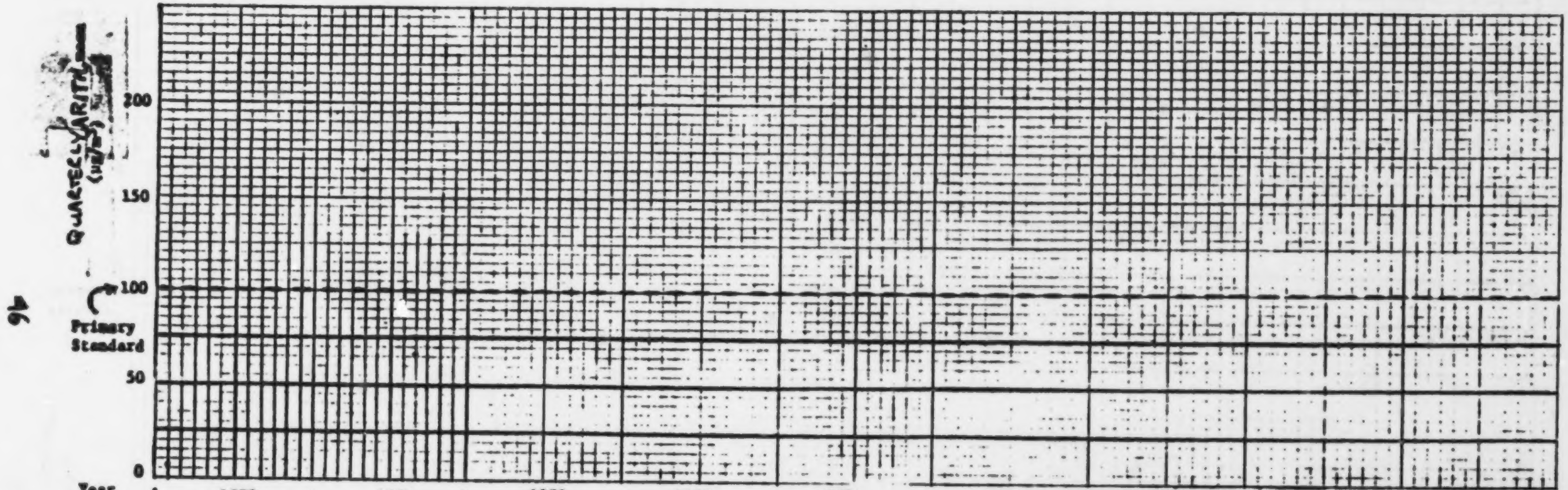
* Value derived from data which do not meet summarization criteria.

2.2.12.5

NO2
CONTINOUS

Site Location: COLSTRIP, MT. (BN SITE)

Site Code: 27136 00 27F03

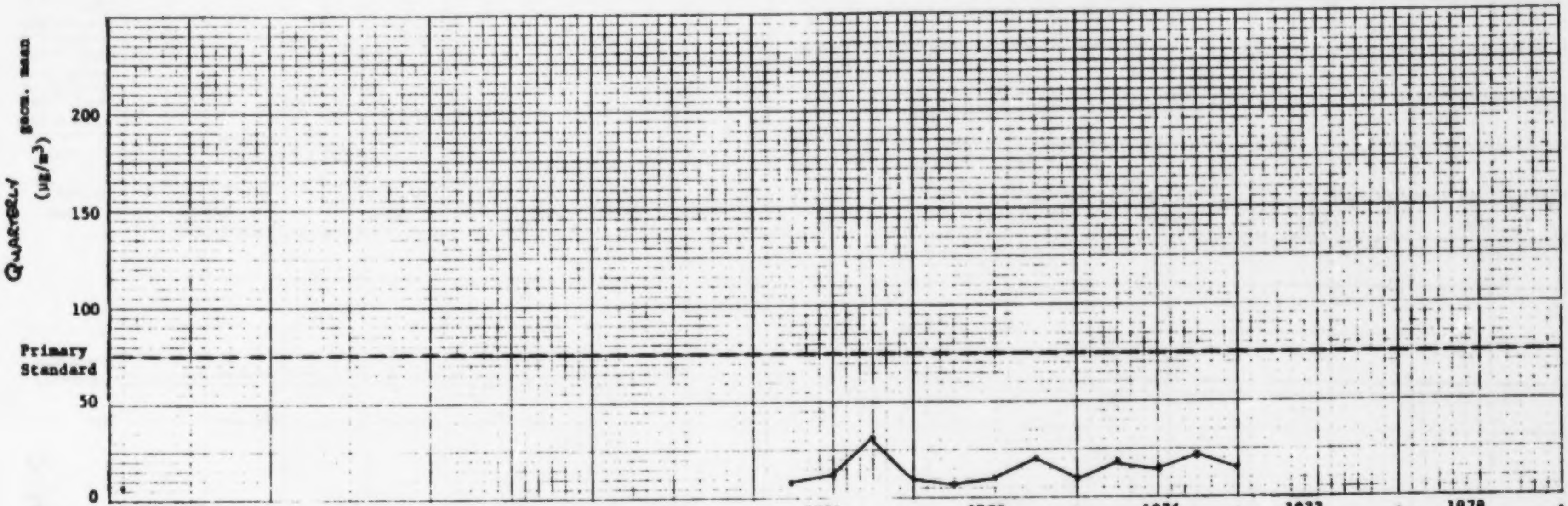


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																						4	31													
Maximum (µg/m³)																						9	9													
2nd Max. (µg/m³)																						9	9													
ARITH. Quarterly mean (µg/m³)																						9*	9*													
No. of Obs >200 µg/m³																																				
No. of Obs >100 µg/m³																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.2.13.1
TSP

Site Location: COLSTRIP, MT. (MACRAE SITE)
Site Code: 27136 0028F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																	27	30	10	17	30	10	4	23	7	28	25	30								
Maximum (µg/m³)																	92	60	43	63	19	15	22	59	37	86	39	55								
2nd Max. (µg/m³)																	25	46	39	35	14	14	22	49	25	86	39	53								
Quarterly geom. mean (µg/m³)																	8	12	32*	11	7	10*	20*	10	18*	15	23	15								
No. of Obs >260 µg/m³																																				
No. of Obs >150 µg/m³																																				

* Value derived from data which do not meet summarization criteria.

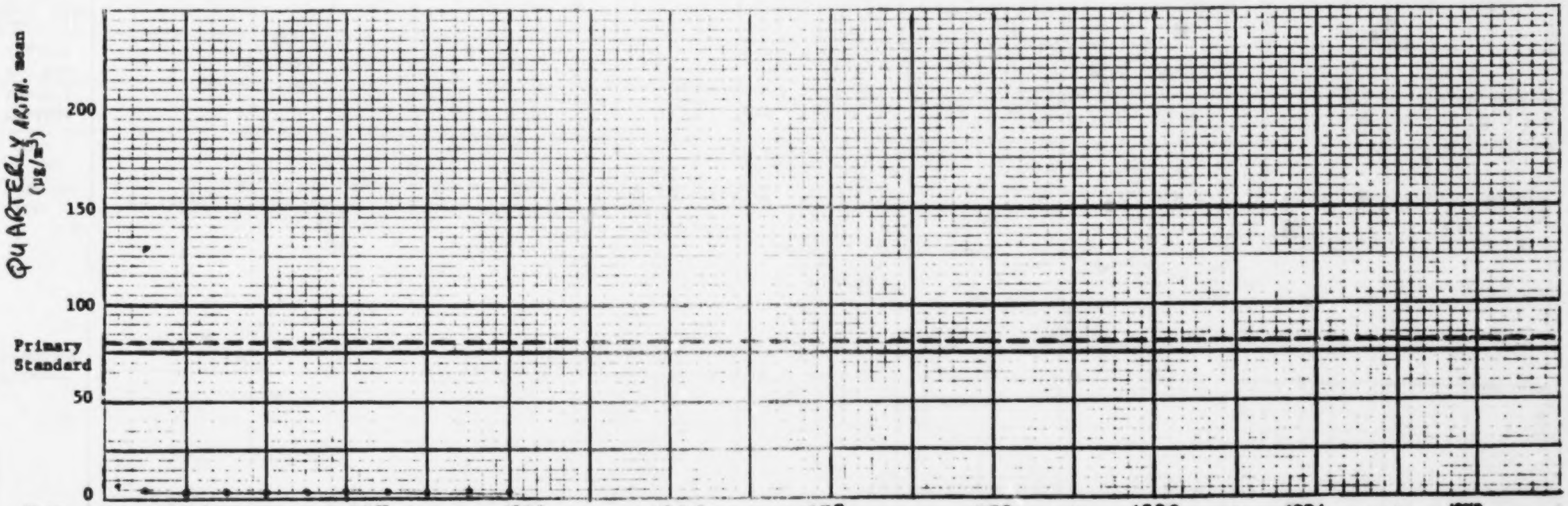
2.2.13.2.

SO_2

bubbler

Site Location: Colstrip, Mt. (Macrae Site)

Site Code: 2713600228F03



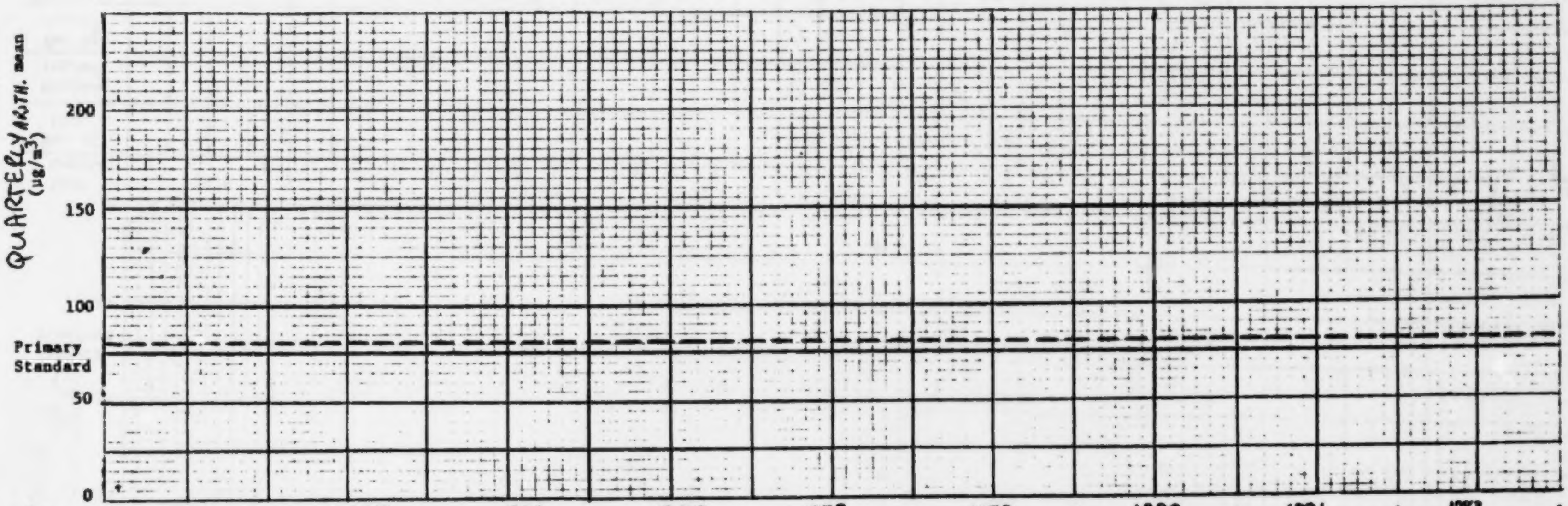
Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.	77	75	63	92	63	39	13	53	48	12	13	19																								
MAXIMUM 24 hr (Mg/m³)	3	3	3	3	3	3	3	5	3	3	3	3																								
2ND MAX 24 hr (Mg/m³)	3	3	3	3	3	3	3	5	3	3	3	3																								
MAXIMUM 3 hr (Mg/m³)																																				
2ND MAX 3 hr (Mg/m³)																																				
QTR. ARITH MEAN (Mg/m³)	3	3	3	3	3		3*	3	3	3	3																									
No. of Obs. > 365 Mg/m³																																				
No. of Obs. > 1300 Mg/m³																																				

* Value derived from data which do not meet summarization criteria.

2. 2. 13. 3.
SO_2
CONTINOU:

Site Location: COLSTRIP, MT (MACRAE SITE)

Site Code: 27136002 8F03

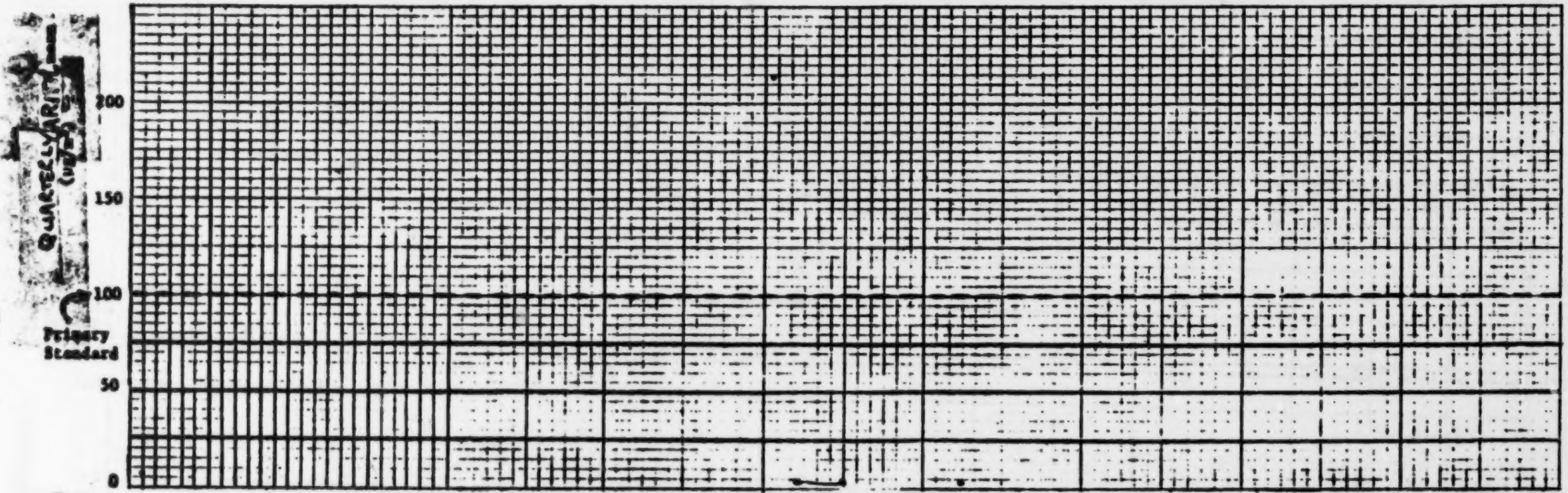


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.	1874	1920	1292	1280	976	858																														
MAXIMUM 24 hr (μg/m³)	3	3	3	3	3	3																														
2ND MAX 24 hr (μg/m³)	3	3	3	3	3	3																														
MAXIMUM 3 hr (μg/m³)	3	3	3	3	3	3																														
2ND MAX 3 hr (μg/m³)	3	3	3	3	3	3																														
QTR. ARITH MEAN (μg/m³)	3	3	3*	3*	3*	3*																														
No. of Obs. >365 μg/m³																																				
No. of Obs. >1300 μg/m³																																				

* Value derived from data which do not meet summarization criteria.

2.2.13.4
NO₂
bubbler

Site Location: Colstrip, Mt. (MACRAE Site)
Site Code: 271360028F03



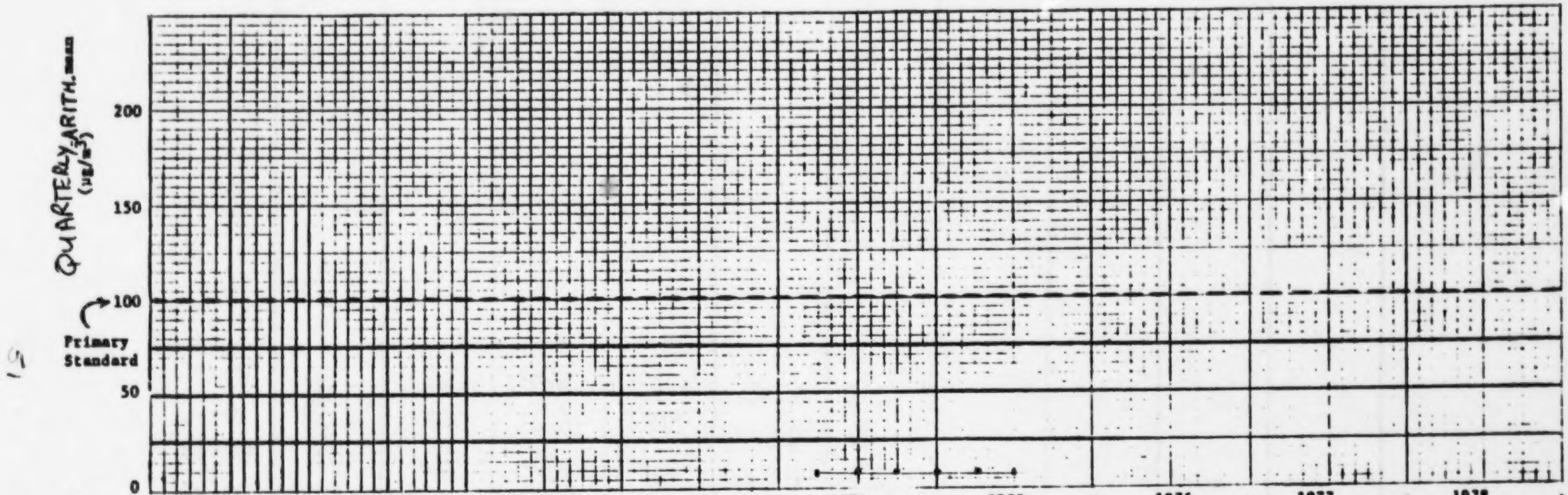
Year	1970				1971				1972				1973			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
ARITH. Quarterly (µg/m³)																
No. of Obs >200 µg/m³																
No. of Obs >100 µg/m³																

Year	1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.	77	75	-	-	63	39	13	59	62	18	13	11								
Maximum (µg/m³)	9	6			8	3	6	6	8	28	6	28								
2nd Max. (µg/m³)	9	6			8	3	6	6	8	21	3	13								
ARITH. Quarterly (µg/m³)	3	3			3	3	3*	3	4	5	3	6								
No. of Obs >200 µg/m³																				
No. of Obs >100 µg/m³																				

* Value derived from data which do not meet summarization criteria.

2. 2. 13. 5
NO_2
CONTINOUS

Site Location: COLSTRIP, MT. (MACRAE SITE)
Site Code: 271360028F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																	1497	2112	1373	2160	1020	38														
Maximum (µg/m³)																	9	9	9	9	9	9														
2nd Max. (µg/m³)																	9	9	9	9	9	9														
ARITH. Quarterly ~~geom.~~ mean (µg/m³)																	9*	9	9*	9	9*	9*														
No. of Obs >200 µg/m³																																				
No. of Obs >100 µg/m³																																				

* Value derived from data which do not meet summarization criteria.

OZONE DATA

TABLE 2.2.12

SITE /QTR		$\mu g/m^3$		$\mu g/m^3$			
		MAX	2ND MAX	ANN ARITH MEAN	ANN GEO MEAN	OOC	% OBS
Colstrip, Mt.							
BN SITE CONTINOUS	75-03	125	116	64	62	925	42
MACRAE SITE CONTINOUS	74-01	104	102	47	44	1588	74
	74-02	157	153	78	76	1982	91
	74-03	195	143	112	111	186	8
	74-04	86	84	52	51	1993	68
	75-01	157	155	127	126	1098	51
	75-02	155	155	104	100	709	32

SECTION 2.3

NORTH DAKOTA

These eight sites were originally established by PEDCo as part of the NGPRP and then were taken over by the State in 1975. During the period of operation by the State the number of observations have increased and the data has been of good quality. None of the sites have been moved since they were established.

Total Suspended Particulate

All eight sites measure TSP. The sites at Bowman, Mott, Garrison, McClusky and Stanton had single excursions per year of the secondary 24 hour standards. The Garrison site had a single excursion of the primary 24 hour standard in 1975. The annual averages of the data do not show any violations of the NAAQS. All the sites had 2 1/2 years of continuous data. The dual site at McClusky will be dismantled and one of the monitors used elsewhere. The other monitor will remain at the McClusky site.

Sulfur Dioxide

Eight quarters worth of data are available from the three sites which have SO_2 bubblers. The Stanton site also has a continuous SO_2 monitor which has been in operation for more than two years. No excursions of any of the NAAQS were recorded. Quarterly averages did not exceed 10 ug/m^3 and annual averages would probably not exceed 5 ug/m^3.

Nitrogen Dioxide

Eight quarters worth of data are available from the three sites that sample for NO_x. The Stanton site also has a continous NO_x monitor which has been in operation for more than two years. No excursions of the NAAQS was recorded. The annual average values at these sites would be less than 10 ug/m^3.

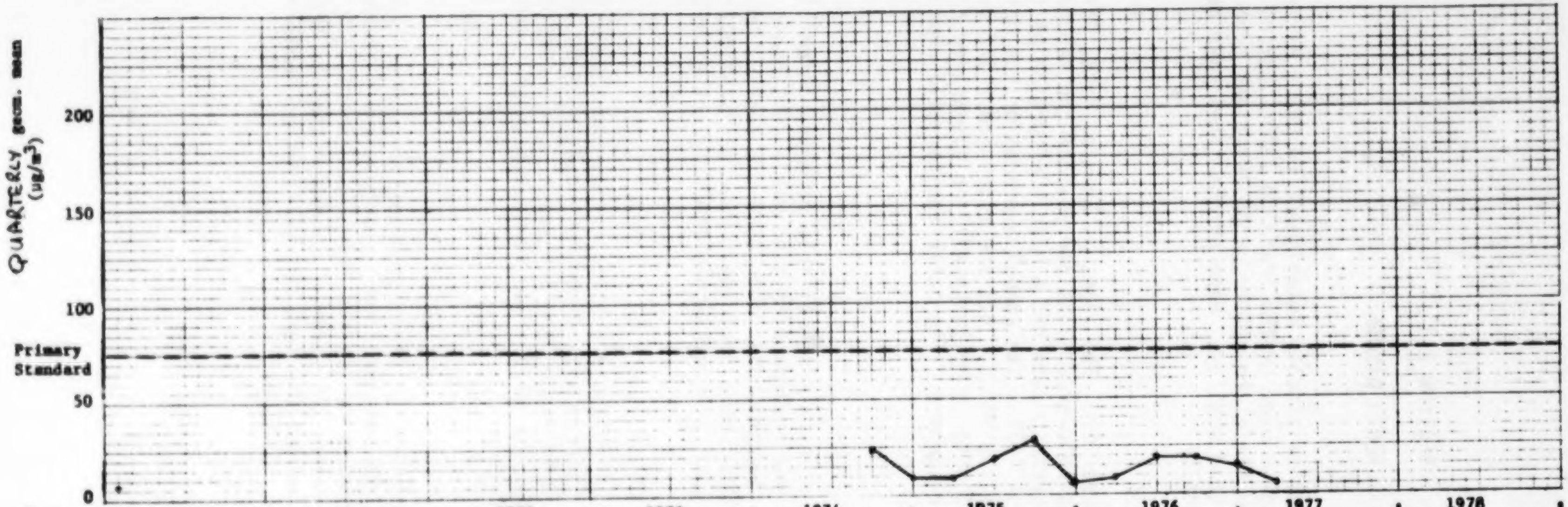
Ozone

Ozone values were recorded for three consecutive quarters (beginning in third quarter 1976) at the Stanton site. Twenty-six violations of the primary NAAQS were recorded during the third quarter of 1976. Maximum one hour concentrations was 196 ug/m^3. No excursions of the NAAQS were recorded at the site during the next two quarters of recorded data.

Fig 2.3.1
TSP

Site Location: MEDORA, N.D

Site Code: 350080001F03



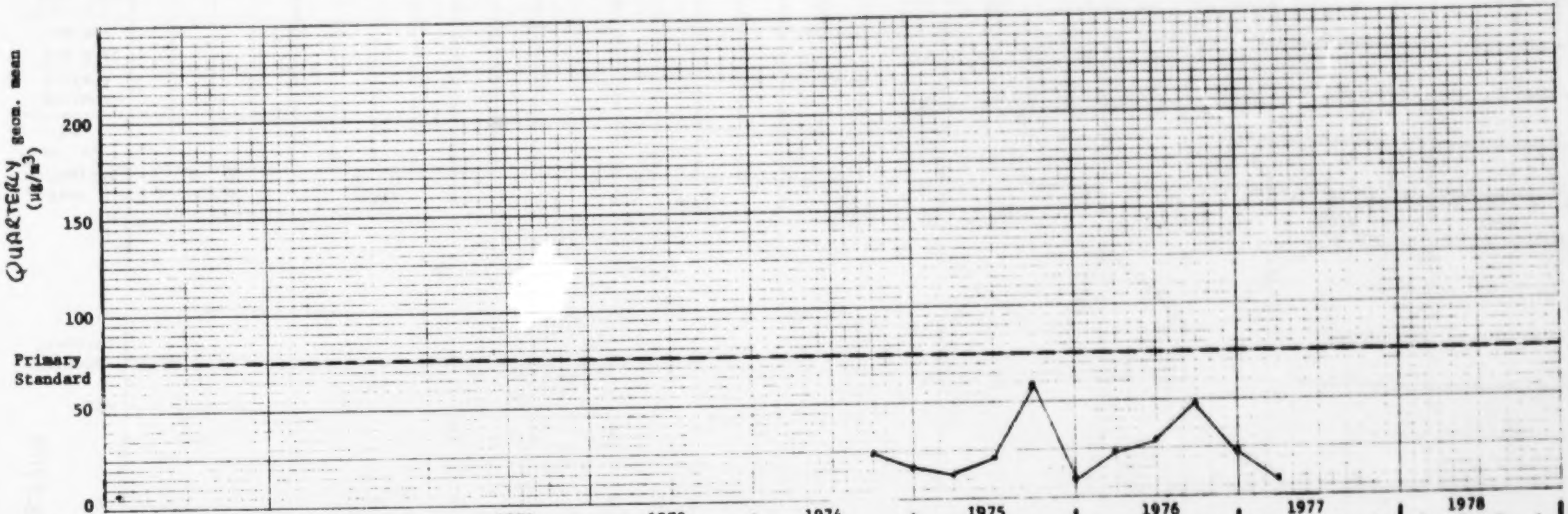
Year	1970				1971				1972				1973			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																
Maximum (ug/m³)																
2nd Max. (ug/m³)																
Quarterly Geom. mean (ug/m³)																
No. of Obs >260 ug/m³																
No. of Obs >150 ug/m³																
No. of Obs/yr.																

Year	1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			4	15	14	14	12	9	5	12	14	12	9							
Maximum (ug/m³)			45	88	37	50	72	19	27	120	39	33	37							
2nd Max. (ug/m³)			26	35	30	38	39	15	13	46	33	32	17							
Quarterly Geom. mean (ug/m³)			24*	9	9	17	28	6	8*	19	19	15	6							
No. of Obs >260 ug/m³			-			-	-	-		-	-	-	-							
No. of Obs >150 ug/m³			-			-	-	-		-	-	-								
No. of Obs/yr.								49				43								

*Value derived from data which do not meet summarization criteria

Fig 2.3.2
TSP

Site Location: Bowman, N.D.
Site Code: 350160001F02



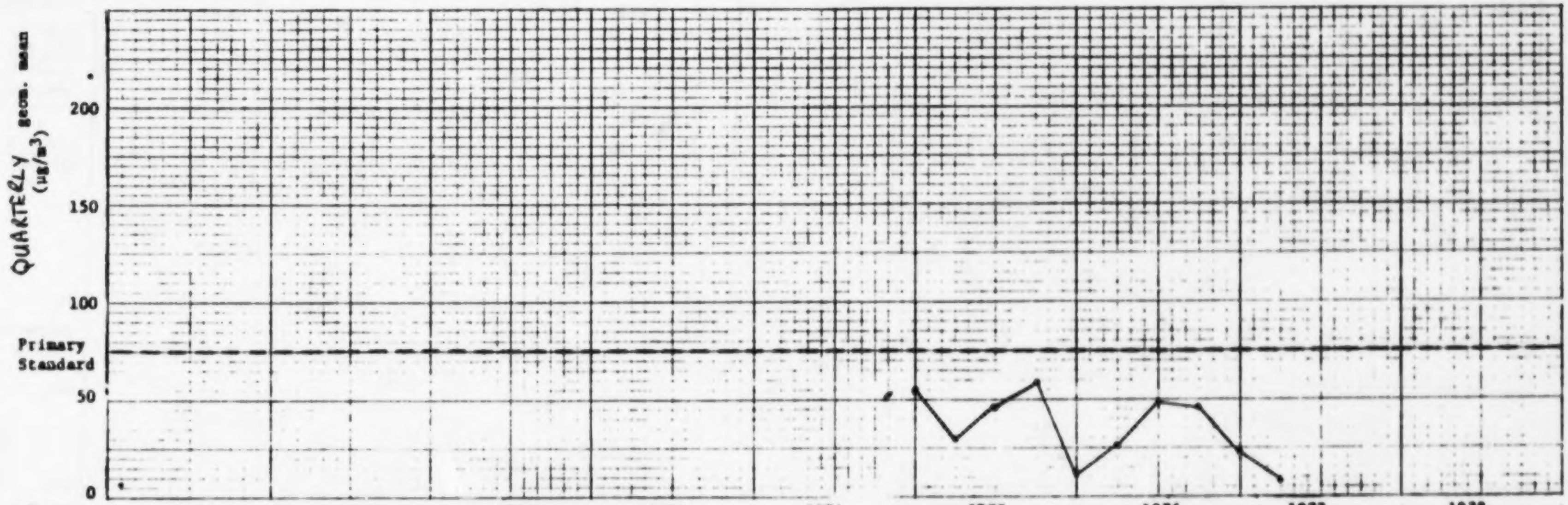
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			5	16	13	10	9	12	14	12	19	14	14							
Maximum (μg/m³)																			48	94	61	52	219	26	127	114	125	53	26							
2nd Max. (μg/m³)																			29	51	46	37	112	24	79	99	109	39	17							
Quarterly geom. mean (μg/m³)																			24*	17	13	21	59	9	24	29	47	23	9							
No. of Obs >260 μg/m³																			.			.	-		-	-	-	.	.							
No. of Obs >150 μg/m³																			-		.	.	1	.	-	-	.	.								

No. of Obs/yr.

* Value derived from data which do not meet summarization criteris.

Fig 2.3.3.1.
TSP

Site Location: MOTT, N.D.
Site Code: 35056001F03



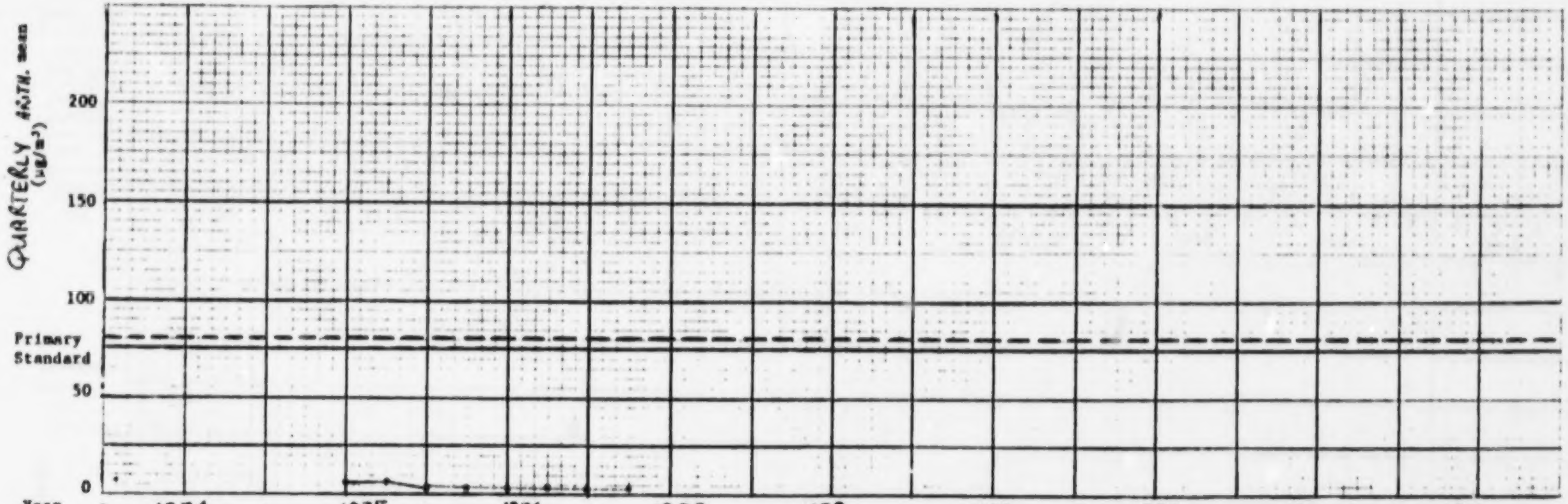
Year / Quarter	1970				1971				1972				1973				1974				1975				1976				1977				1978			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				15	13	14	13	13	15	16	15	15	14							
Maximum (µg/m³)																				93	57	107	129	39	156	201	88	52	61							
2nd Max. (µg/m³)																				84	49	88	113	36	119	129	79	49	33							
Quarterly geom. mean (µg/m³)																				22	30	46	59	19	27	48	47	23	9							
No. of Obs >260 µg/m³																				-		-	-	-	-	-	-	-	-							
No. of Obs >150 µg/m³																				-		-	-	-	1	-	-	-	-							
No. of Obs/yr.																								52				61								

* Value derived from data which do not meet summarization criteria.

Fig 2.3.3.2
SO_2
BUBBLER

Site Location: MOTT, N.D.

Site Code: 350560001F03

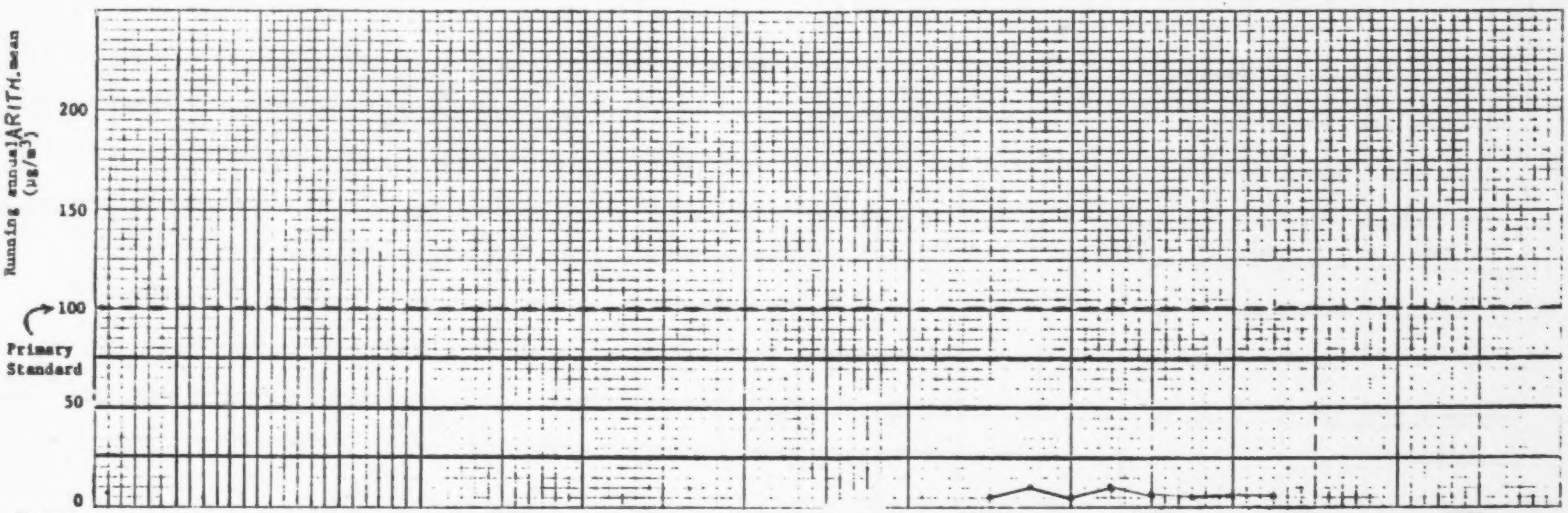


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.						15	14	14	13	16	15	15	12																							
MAXIMUM 24hr (µg/m³)						16	35	3	3	3	3	3	3																							
2ND MAX 24hr (µg/m³)						15	22	3	2	3	3	3	3																							
MAXIMUM 3hr (µg/m³)																																				
2ND MAX 3hr (µg/m³)																																				
QTR. ARITH MEAN (µg/m³)						7	8	3	3	3	3	3	2																							
No. of Obs. >.365 µg/m³						.	.	.	-	.	-	-																								
No. of Obs. >1300 µg/m³																																				

Fig 2.3.3.3.
NO$_2$
bubbler

Site Location: Mott, N.D.

Site Code: 350560001F03

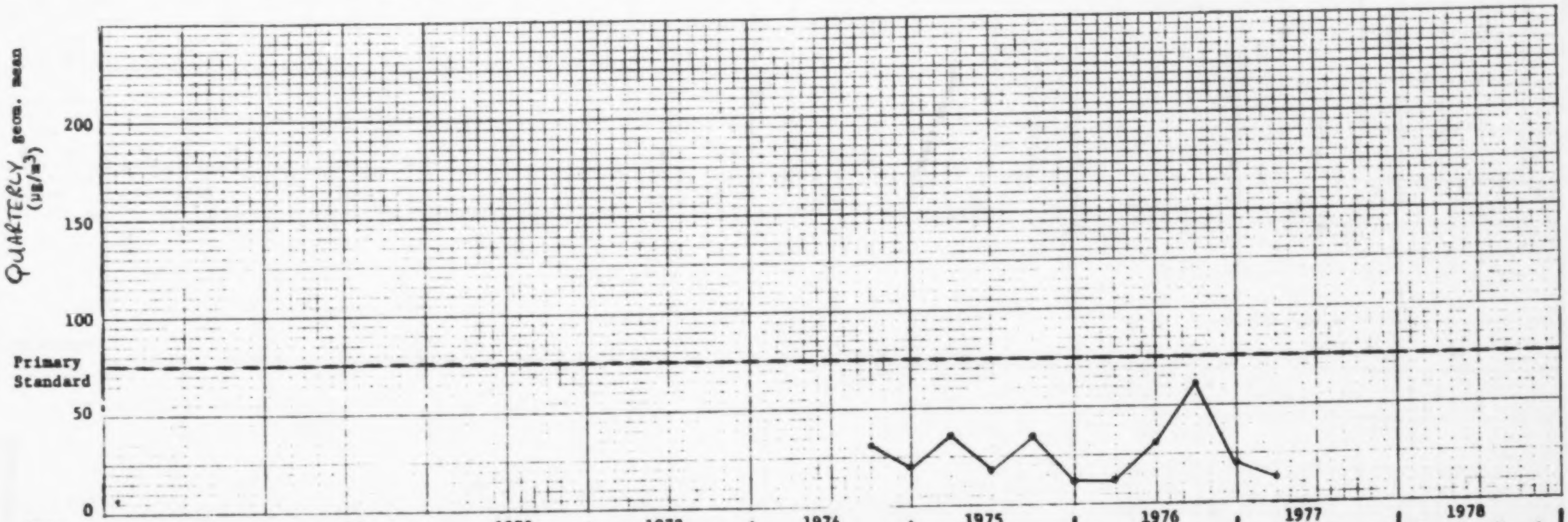


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																						14	14	19	13	16	15	15	12							
Maximum (µg/m^3)																						16	43	20	25	17	11	13	19							
2nd Max. (µg/m^3)																						11	20	12	22	16	7	12	11							
Quarterly ARITH. mean (µg/m^3)																						6	11	6	10	7	5	6	6							
No. of Obs >200 µg/m^3																						-	-	-	-	-	-	-	-							
No. of Obs >100 µg/m^3																						-	-	-	-	-	-	-	-							

* Value derived from data which do not meet summarization criteria.

Fig 2.3.4.1.
TSP

Site Location: GARRISON, N.D.
Site Code: 350720001F03



Year	1970				1971				1972				1973			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
Quarterly geom. mean (µg/m³)																
No. of Obs >260 µg/m³																
No. of Obs >150 µg/m³																
No. of Obs/yr.																

Year	1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			3	16	13	14	14	14	9	16	15	13	15							
Maximum (µg/m³)			36	112	278	76	85	35	26	91	176	49	59							
2nd Max. (µg/m³)			22	102	159	39	75	26	18	86	105	49	18							
Quarterly geom. mean (µg/m³)			32	21	36	16	35	13	13	32	62	21	13							
No. of Obs >260 µg/m³			-	-	1	-	-	-	-	-	-	-	-							
No. of Obs >150 µg/m³			-	-	1	-	-	-	-	-	1	-	-							
No. of Obs/yr.								55				53								

*Value derived from data which do not meet summarization criteria.

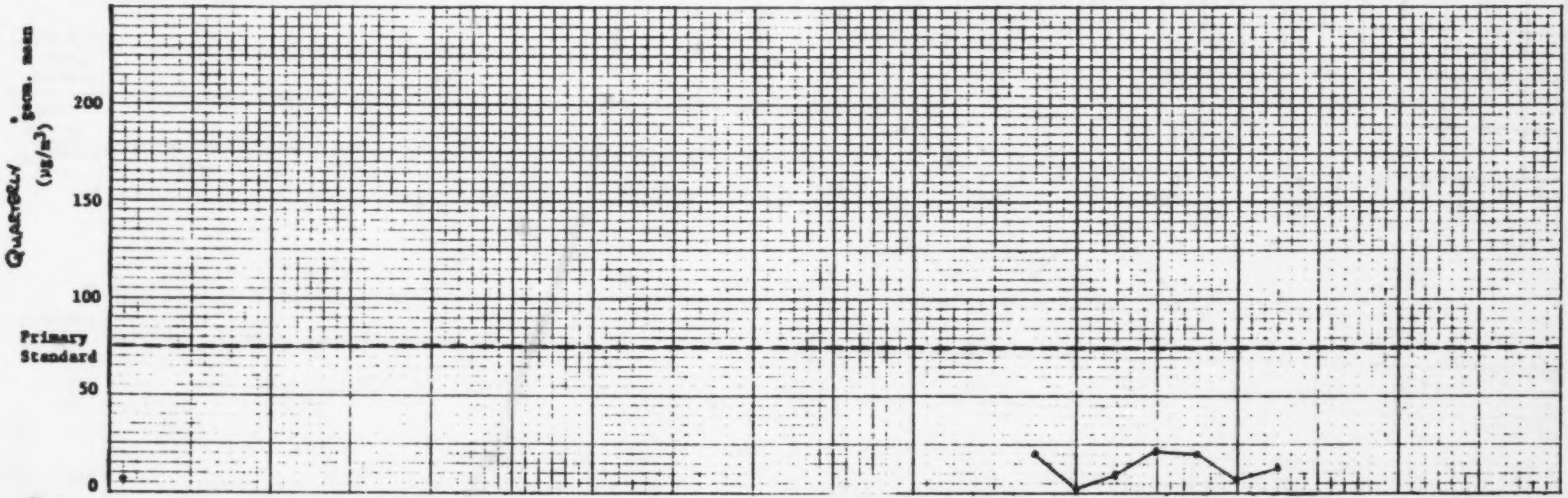
Fig. 2.3.4.2.

TSP

(MEMBRANE SAMPLER)

Site Location: GARRISON, N.D.

Site Code: 350720001F03



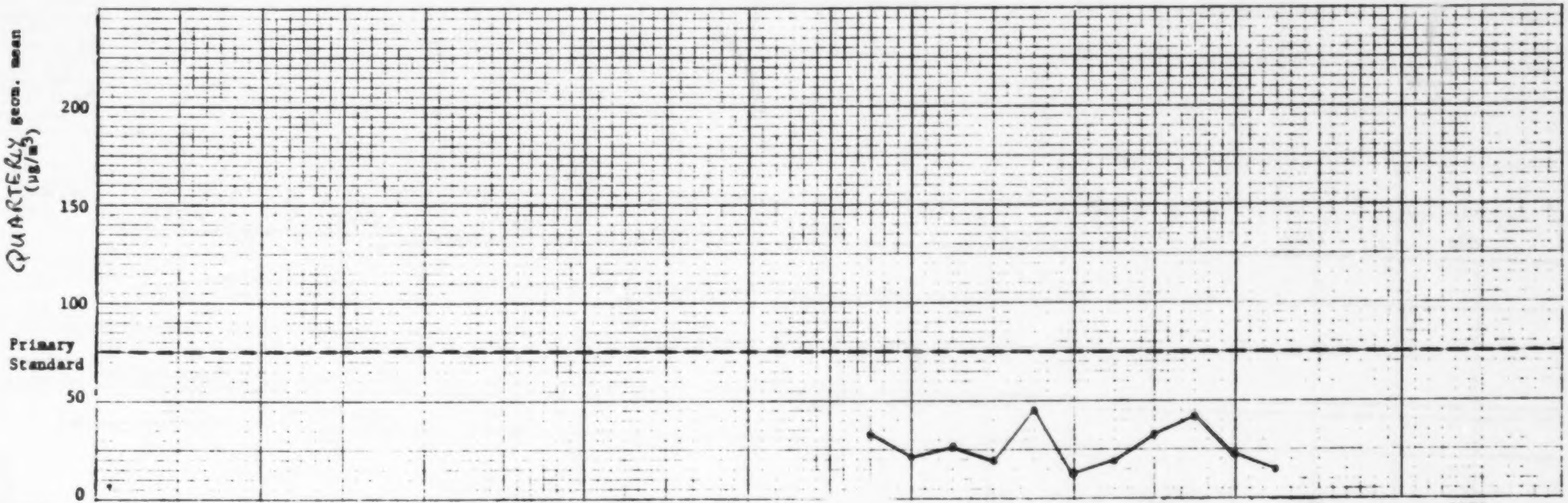
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																							4	16	19	16	19	9	7							
Maximum (µg/m³)																							44	31	43	59	38	23	43							
2nd Max. (µg/m³)																							40	15	31	51	39	19	14							
Quarterly geom. mean (µg/m³)																							20*	2	10	22	20	7	19							
No. of Obs >260 µg/m3																																				
No. of Obs >150 µg/m3																																				

* Value derived from data which do not meet summarization criteria.

Fig. 2.3.5.1.
TSP

Site Location: WASHBURN, N.D.

Site Code: 350720002F03



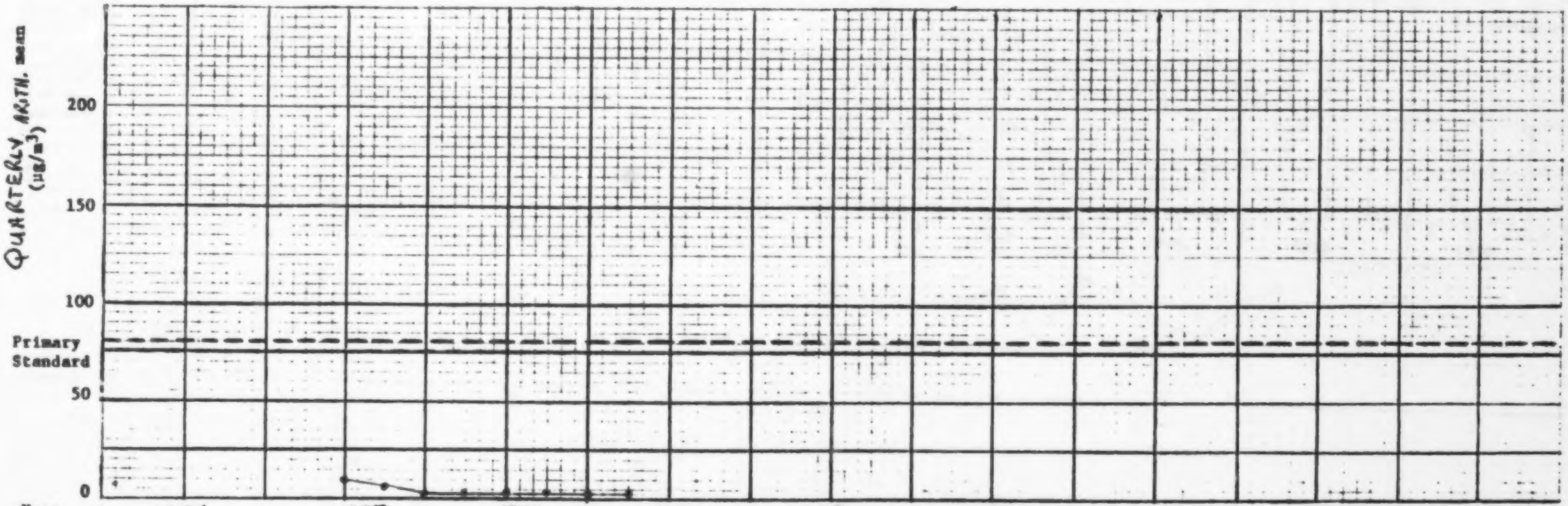
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			4	16	12	15	13	15	14	15	13	13	15							
Maximum (µg/m³)																			82	128	69	83	101	93	127	82	67	78	30							
2nd Max. (µg/m³)																			33	81	67	55	92	38	59	65	67	63	24							
Quarterly geom. mean (µg/m³)																			33*	21	27	19	15	14	18	33	42	23	15							
No. of Obs >260 µg/m³																			-	-		-	-	-	-	-	-	-	-							
No. of Obs >150 µg/m³																				-		-	-	-			-	-	-							
No. of Obs/yr.																								[illegible]				[illegible]								

*Value derived from data which do not meet summarization criteria.

Fig 2.3.5.2
SO_2
BUBBLER

Site Location: WASHBURN, N.D.

Site Code: 35072000 2F03



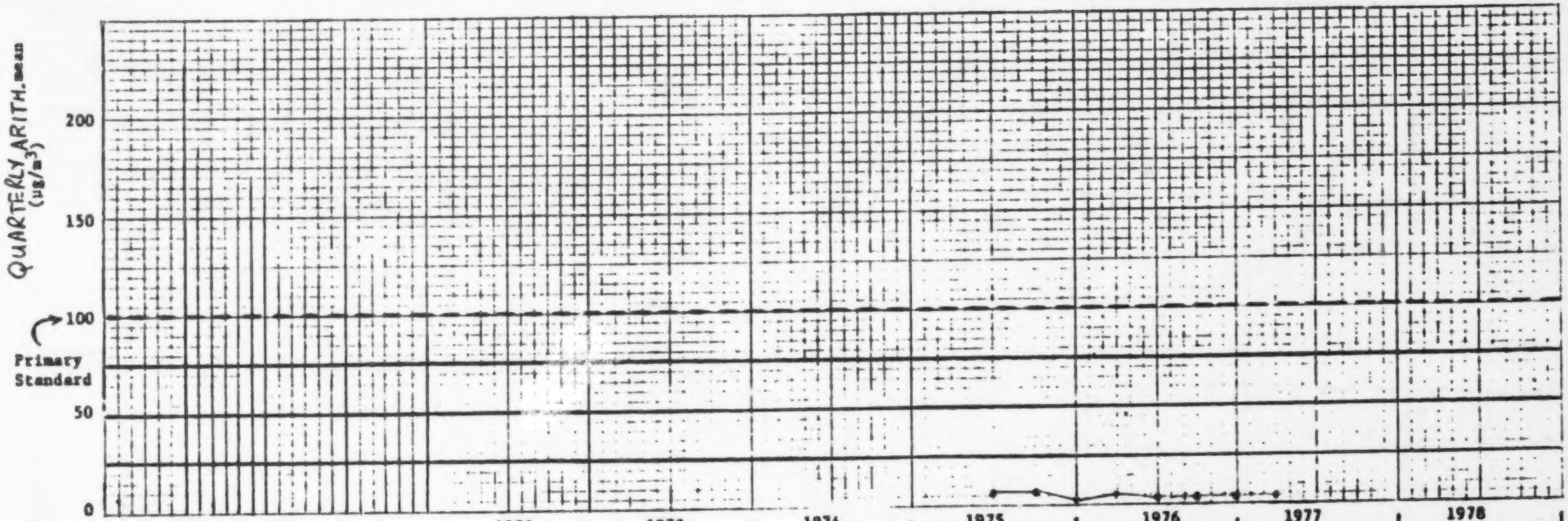
Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.						15	14	15	13	15	15	14	15																							
MAXIMUM 24 hr (µg/m³)						50	18	3	3	3	3	3	3																							
2ND MAX 24 hr (µg/m³)						26	16	3	3	3	3	3	3																							
MAXIMUM 3 hr (µg/m³)																																				
2ND MAX 3 hr (µg/m³)																																				
QTR. ARITH MEAN (µg/m³)						10	7	3	3	3	3	3	3																							
No. of Obs. >365 µg/m³						-	-	-	-	-	-	-	-																							
No. of Obs. >1300 µg/m³																																				

62

Fig 2.3.5.3
NO_2
bubbler

Site Location: WASHBURN, N.D.

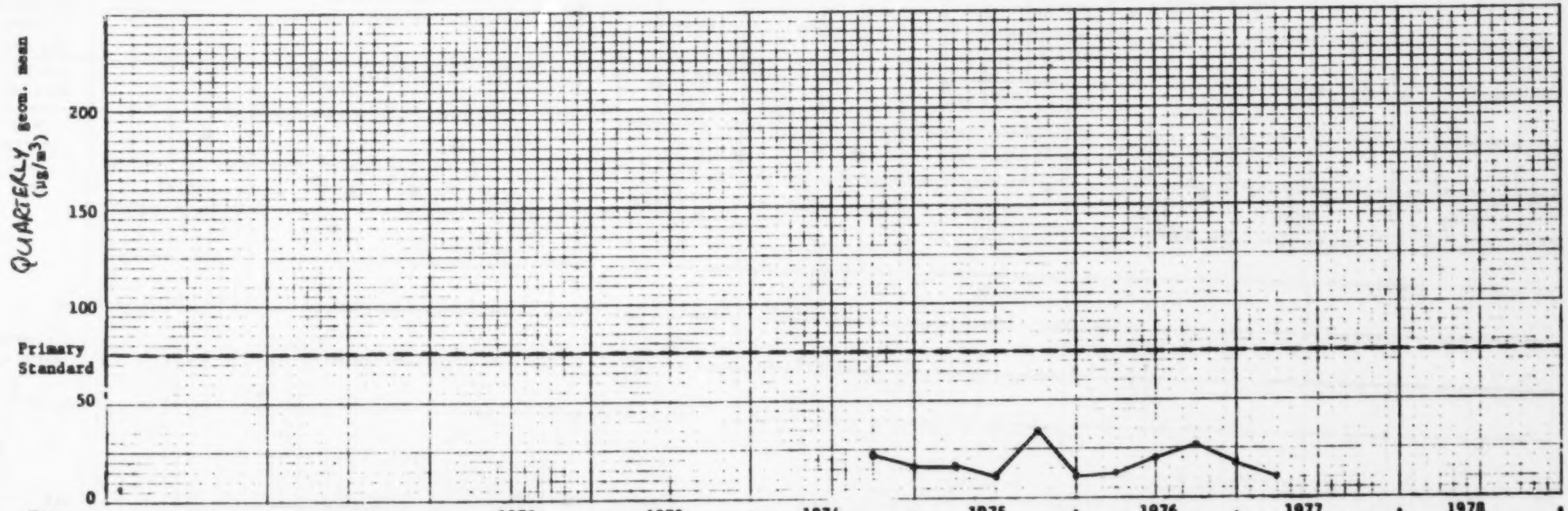
Site Code: 350720002F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																						15	19	15	8	15	14	19	15							
Maximum (µg/m3)																						34	33	3	13	10	3	3	7							
2nd Max. (µg/m3)																						17	13	3	10	8	3	3	5							
Quarterly ARITH. mean (µg/m3)																						7	7	3	5	3	3	3	3							
No. of Obs >200 µg/m3																																				
No. of Obs >100 µg/m3																																				

Fig 2.3.6.
TSP

Site Location: PARSHALL, N.D.
Site Code: 350820001F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			5	16	10	13	7	11	10	16	19	15	11							
Maximum (µg/m³)																			64	114	55	45	87	31	53	64	67	76	57							
2nd Max. (µg/m³)																			22	63	39	38	63	16	24	60	50	50	27							
Quarterly geom. mean (µg/m³)																			23*	17	17	12	39	11	13	20	28	18	11							
No. of Obs >260 µg/m³																			-	-	-	-	-	-	-	-	-	-	-							
No. of Obs >150 µg/m³																			-	-	-	-	-	-	-	-	-	-	-							
No. of Obs/yr.																								41				60								

* Value derived from data which do not meet summarization criteria.

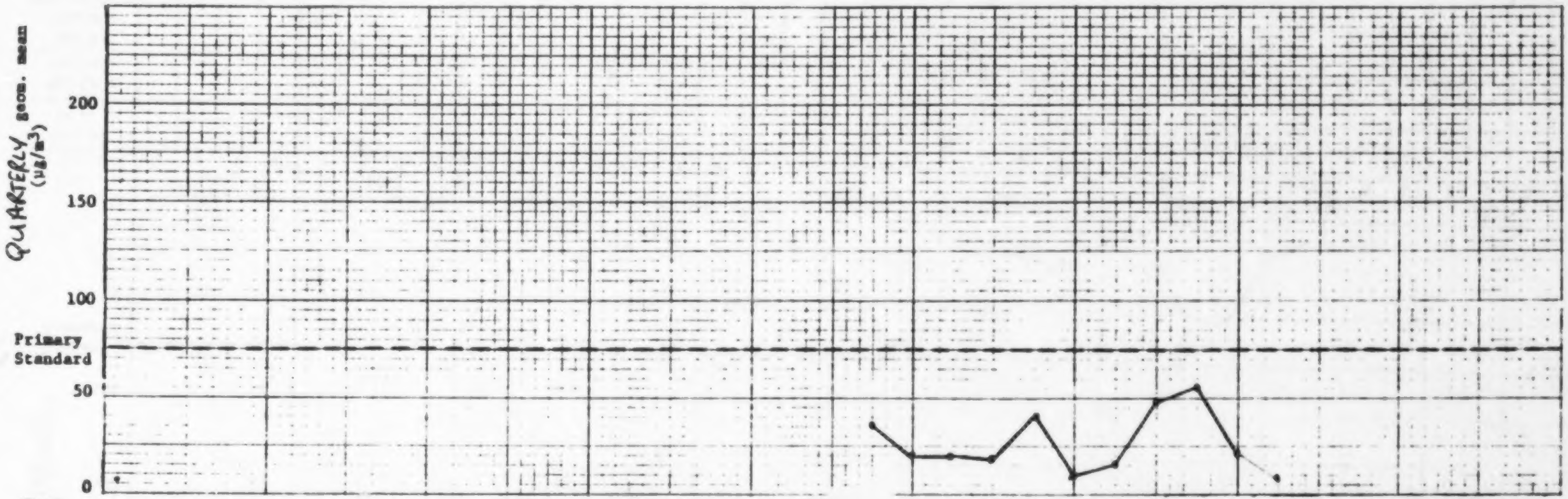
Fig. 2.3.7.1

TSP

(Dual Site)

Site Location: Mc Clusky, N.D.

Site Code: 35106000 1F03



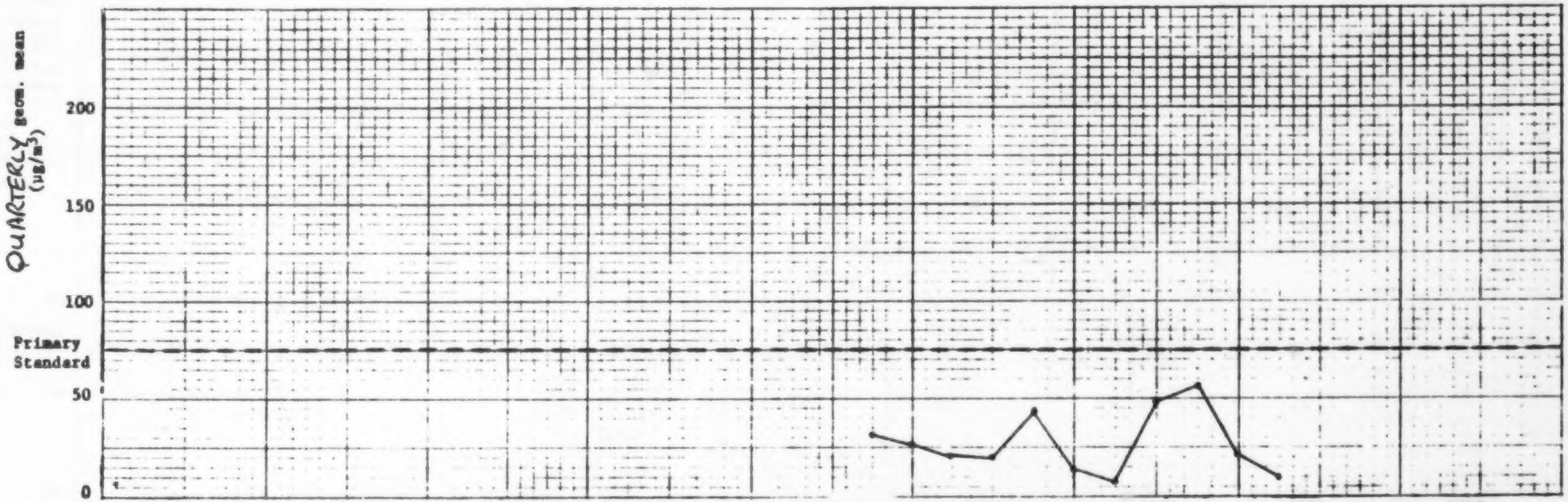
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			4	15	13	11	7	8	11	14	15	15	12							
Maximum (µg/m³)																			75	168	123	73	96	49	149	98	137	46	18							
2nd Max. (µg/m³)																			39	94	49	50	77	29	50	93	105	46	18							
Quarterly geom. mean (µg/m³)																			36*	20	21	18	40	10	17	48	56	22	9							
No. of Obs >260 µg/m³																			-	-	-	-	-		-	-	-	-	-							
No. of Obs >150 µg/m³																				1	-	-	-	-	-	-	-	-	-							
No. of Obs/yr.																								39				55								

* Value derived from data which do not meet summarization criteria.

Fig. 2.3.7.2
TSP

DUAL SITE

Site Location: McClusky, N.D.
Site Code: 351060002F03



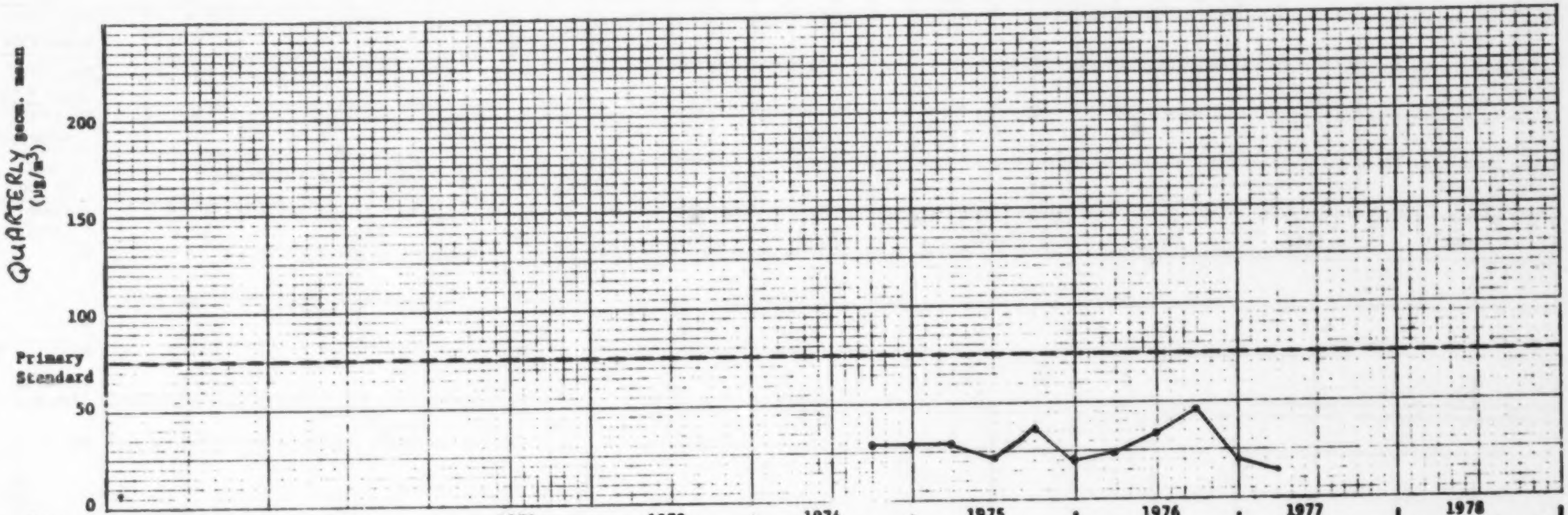
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			5	15	13	10	7	13	7	15	19	15	12							
Maximum (µg/m³)																			62	157	123	71	90	97	20	198	113	82	22							
2nd Max. (µg/m³)																			43	89	59	60	84	91	15	136	94	49	18							
Quarterly geom. mean (µg/m³)																			32*	27	21	20	43	19	7	49	57	22	10							
No. of Obs >260 µg/m³																			-	-	-	-	-		-	-		-	-							
No. of Obs >150 µg/m³																			-	1	-	-	-		-	-	-	-	-							
No. of Obs/yr.																								43				51								

* Value derived from data which do not meet summarization criteria.

Fig 2.3.8.1.
TSP

Site Location: STANTON, N.D.

Site Code: 350860001F03



Year Quarter	1970 1	1970 2	1970 3	1970 4	1971 1	1971 2	1971 3	1971 4	1972 1	1972 2	1972 3	1972 4	1973 1	1973 2	1973 3	1973 4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
Quarterly geom. mean (µg/m³)																
No. of Obs >260 µg/m³																
No. of Obs >150 µg/m³																
No. of Obs/yr.																

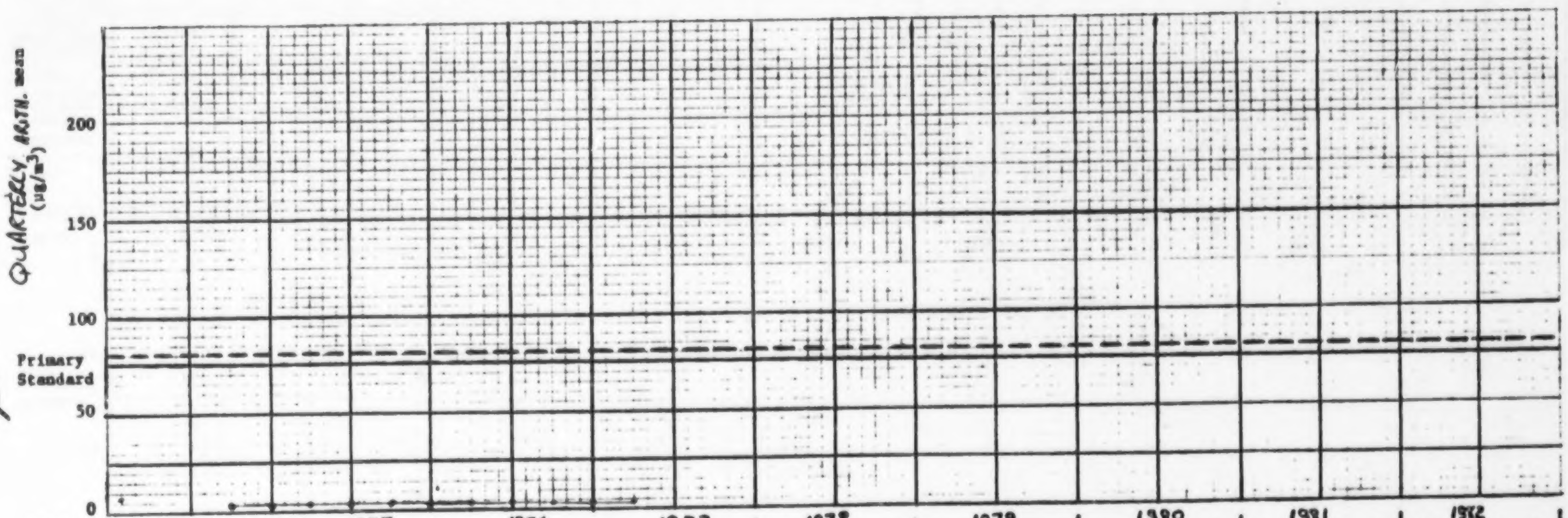
Year Quarter	1974 1	1974 2	1974 3	1974 4	1975 1	1975 2	1975 3	1975 4	1976 1	1976 2	1976 3	1976 4	1977 1	1977 2	1977 3	1977 4	1978 1	1978 2	1978 3	1978 4
No. of Obs.			5	16	15	15	14	12	15	16	15	15	14							
Maximum (µg/m³)			128	185	99	71	125	73	150	104	74	54	27							
2nd Max. (µg/m³)			25	158	75	50	59	64	68	88	70	52	22							
Quarterly geom. mean (µg/m³)			28*	28	29	22	37	20	29	34	46	20	15							
No. of Obs >260 µg/m³			-	2		-	-	-	-	-	-	-	.							
No. of Obs >150 µg/m³			.	1		-	-	-	1	-	-	-	.							
No. of Obs/yr.								56				61								

* Value derived from data which do not meet summarization criteria.

Fig. 2.3.8.2
SO_2
CONTINOUS

Site Location: STANTON, N.D.

Site Code: 350860001F03

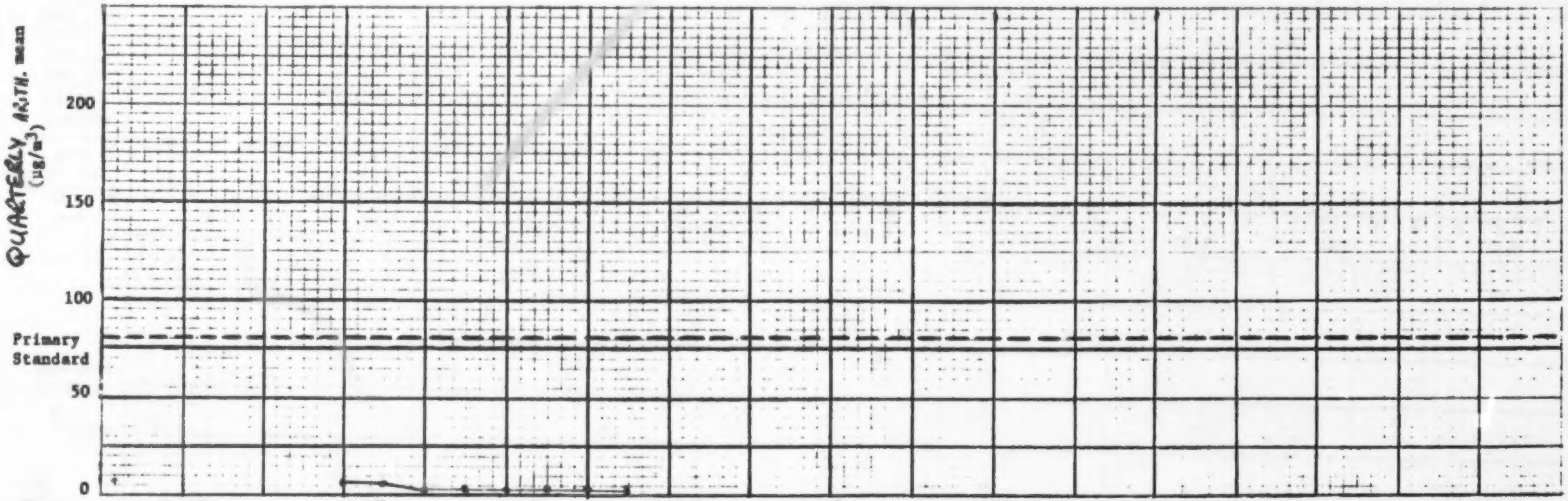


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			558	1529	1682	1829	1966	2028	1837	569	74	1823	1912																							
MAXIMUM 24 hr (μg/m^3)			17	22	23	10	16	5	132	123	3	15	17																							
2ND MAX 24 hr (μg/m^3)			14	21	21	6	9	4	14	4	3	15	21																							
MAXIMUM 3 hr (μg/m^3)			39	66	105	53	52	10	-	85	3	79	96																							
2ND MAX 3 hr (μg/m^3)			26	49	79	28	36	10	17	10	3	79	79																							
QTR. ARITH MEAN (μg/m^3)			3*	2*	4	3	3	3	4	4	3	3	4																							
No. of Obs. > 365 μg/m^3			-	-				-																												
No. of Obs. > 1300 μg/m^3																																				

Fig 2.3.8.3
SO_2
bubbler

Site Location: STANTON, N.D.

Site Code: 350860001F03

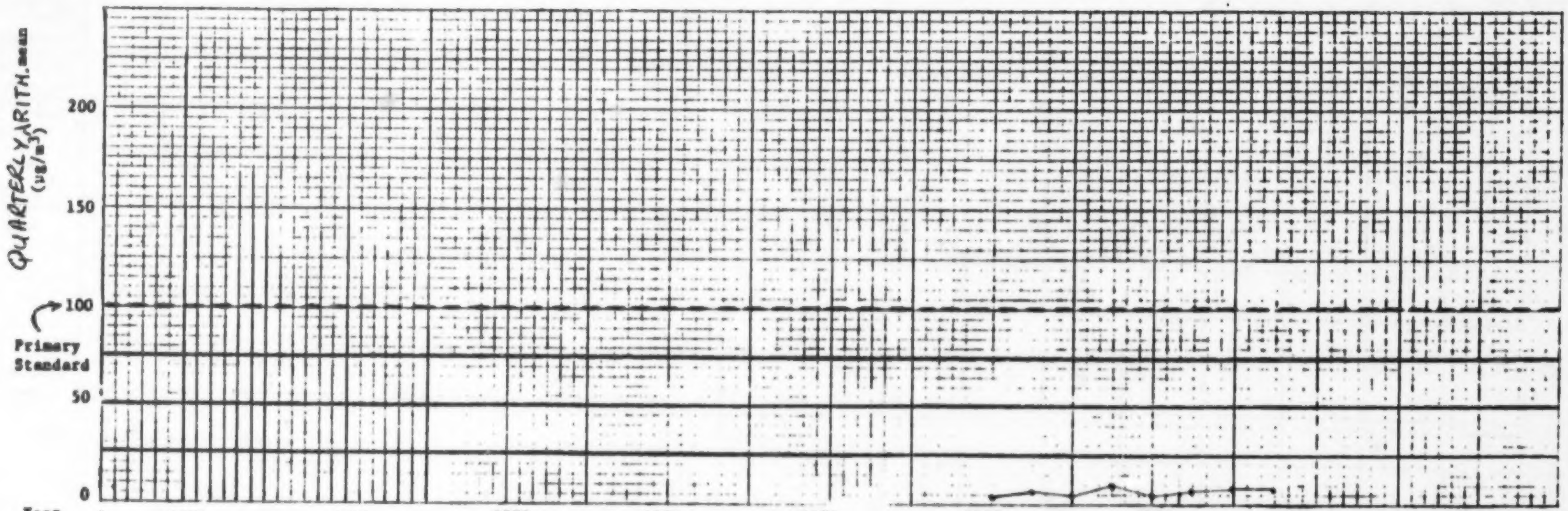


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.						15	19	19	14	16	15	15	15																							
MAXIMUM 24 hr (µg/m³)						28	25	15	3	3	3	3	3																							
2ND MAX 24 hr (µg/m³)						19	14	3	3	3	3	3	3																							
MAXIMUM 3 hr (µg/m³)																																				
2ND MAX 3 hr (µg/m³)																																				
QTR. ARITH MEAN (µg/m³)						7	7	3	3	3	3	3	3																							
No. of Obs. >365 µg/m³						-	-	-	-	-	-	-	-																							
No. of Obs. >1300 µg/m³																																				

Fig 2.3.8.4
NO₂
bubbler

Site Location: STANTON, N.D.

Site Code: 350860001F03



Year	1970				1971				1972				1973				1974			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				
Maximum (µg/m³)																				
2nd Max. (µg/m³)																				
ARITH. Quarterly mean (µg/m³)																				
No. of Obs >200 µg/m³																				
No. of Obs >100 µg/m³																				

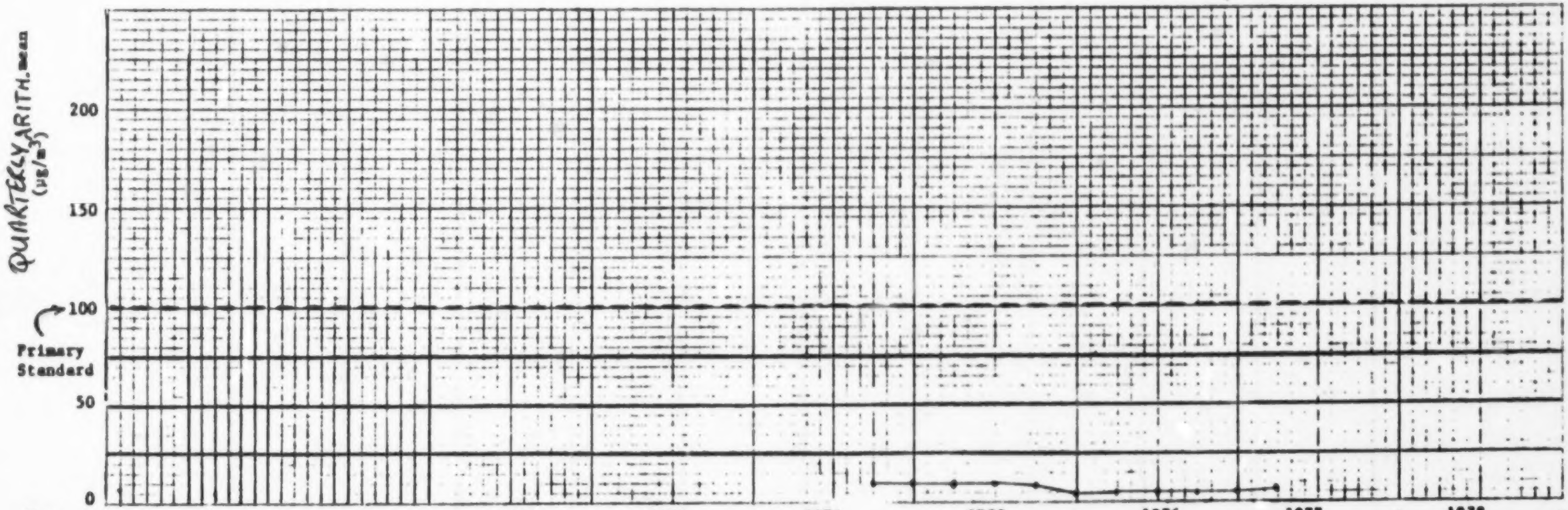
Year	1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.		16	14	14	14	16	15	15	15							
Maximum (µg/m³)		9	32	12	22	10	30	13	16							
2nd Max. (µg/m³)		7	10	12	20	10	8	12	11							
ARITH. Quarterly mean (µg/m³)		4	7	5	10	5	7	8	8							
No. of Obs >200 µg/m³																
No. of Obs >100 µg/m³																

No. of Obs/yr.

*Value derived from data which do not meet summarization criteria

Fig 2.3.8.5.
NO$_2$
CONTINOUS

Site Location: STANTON, N.D.
Site Code: 350860001F03



Year Quarter	1970 1	2	3	4	1971 1	2	3	4	1972 1	2	3	4	1973 1	2	3	4
No. of Obs.																
1 hr Maximum (ug/m^3)																
1 hr 2nd Max. (ug/m^3)																
ARITH. Quarterly mean (ug/m^3)																
No. of Obs >200 ug/m^3																
No. of Obs >100 ug/m^3																

Year Quarter	1974 1	2	3	4	1975 1	2	3	4	1976 1	2	3	4	1977 1	2	3	4	1978 1	2	3	4
No. of Obs.			558	1826	1776	1970	1360	2059	929	879	1793	2023	1303							
1 hr Maximum (ug/m^3)			38	38	56	56	19	56	38	56	56	56	75							
1 hr 2nd Max. (ug/m^3)			38	38	56	38	19	38	38	56	38	38	75							
ARITH. Quarterly mean (ug/m^3)			10*	10	10	10	9*	5	6*	6*	5	6	7							
No. of Obs >200 ug/m^3																				
No. of Obs >100 ug/m^3																				

No. of Obs/yr.

* Value derived from data which do not meet summarization criteria.

OZONE DATA NORTH DAKOTA TABLE 2.3.8

SITE / QTR	Mγ/m^3		Mγ/m^3				Number of VIOLATIONS				
	1hr MAX	1hr 2ND MAX	ANNUAL ARITH MEAN	ANNUAL geo. MEAN	Number OBS	% obs	PRI	Sec			
STANTON											
76-03	196	196	80	71	1394	63	26	26			
76-04	98	98	58	56	1827	83	-	-			
77-01	118	118	63	60	2000	93	-	-			

SECTION 2.4

SOUTH DAKOTA

Operator difficulties have necessitated some changes in the monitoring network in South Dakota. The original NGPRP site at Belle Fourche has been moved to a site closer to Newell, South Dakota which is east of Belle Fourche. Only one hi-vol sampler remains at the Buffalo site which until recently operated dual hi-vol samplers.

Total Suspended Particulates

Three sites in South Dakota measure TSP. None of these sites had any data which exceeded the NAAQS for TSP.

Sulfur Dioxide

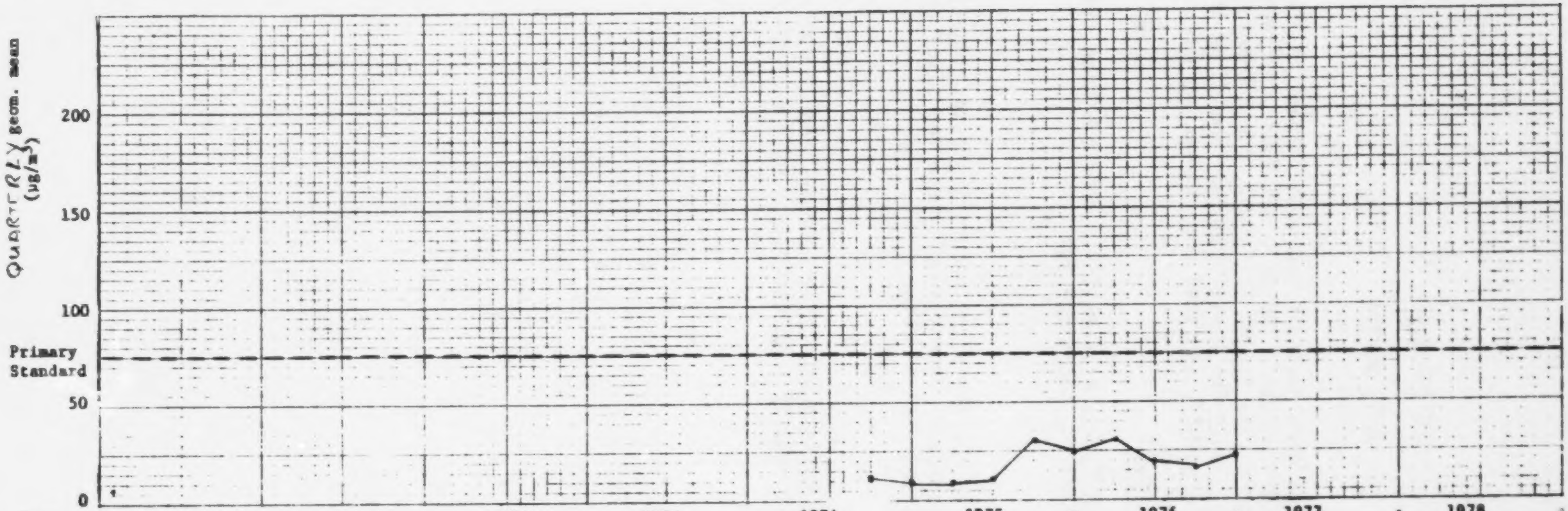
The Buffalo and Belle Fourche sites record SO_2 data. No violations of the NAAQS has been recorded. Operation of these two sites has been poor so there is not a great deal of data.

Nitrogen Dioxide

NO_x was measured at Buffalo and Belle Fourche. Again operator problems have plagued the results. No excursions of the NAAQS have been recorded.

Fig 2.9.1.1
TSP
(DUAL SITE)

Site Location: BUFFALO, S.D.
Site Code: 43076??01F?3

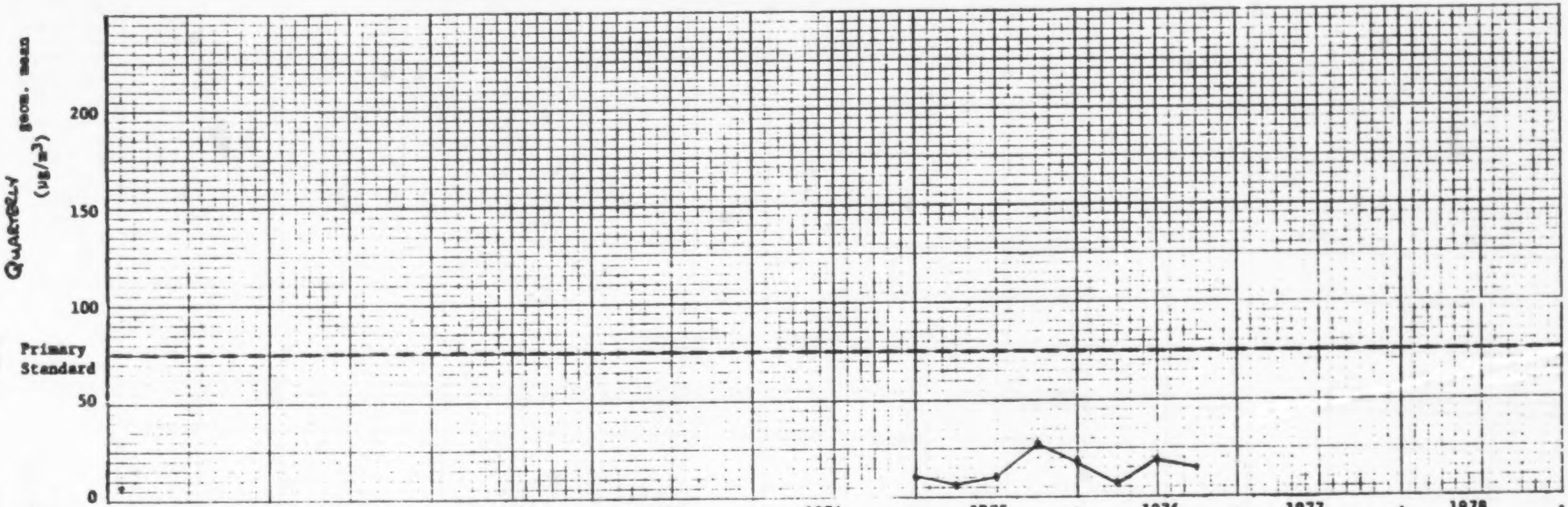


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			5	16	13	13	10	3	2	6	5	5								
Maximum (µg/m³)																			36	30	22	32	61	29	45	56	24	37								
2nd Max. (µg/m³)																			25	25	15	24	46	22	22	23	22	22								
Quarterly geom. mean (µg/m³)																			12*	10	9	11	29	24*	31*	19	17*	22*								
No. of Obs >260 µg/m³																			-					-	-		-	-								
No. of Obs >150 µg/m³																			-						-		-	-								
No. of Obs/yr.																								39				18								

* Value derived from data which do not meet summarization criteria.

Fig 2.9.1.2
TSP
DUAL SITE

Site Location: BUFFALO, S.D.
Site Code: 430760002F03



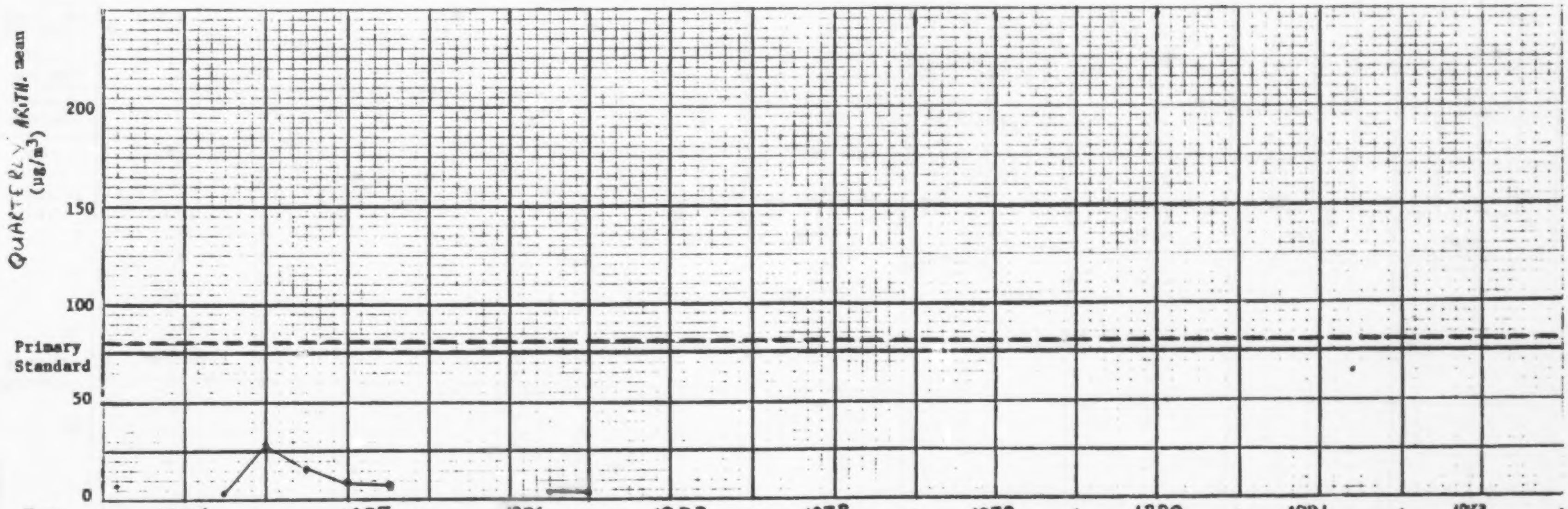
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				16	13	14	11	3	7	6	6									
Maximum (μg/m^3)																				51	16	23	48	23	28	56	28									
2nd Max. (μg/m^3)																				30	13	23	47	19	16	23	27									
Quarterly geom. mean (μg/m^3)																				11	6	11	28	17*	8	19	15									
No. of Obs >260 μg/m^3																				-	-	-														
No. of Obs >150 μg/m^3																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.9.1.3
SO_2
[illegible]

Site Location: Buffalo, S.D.

Site Code: 43076 0001F02



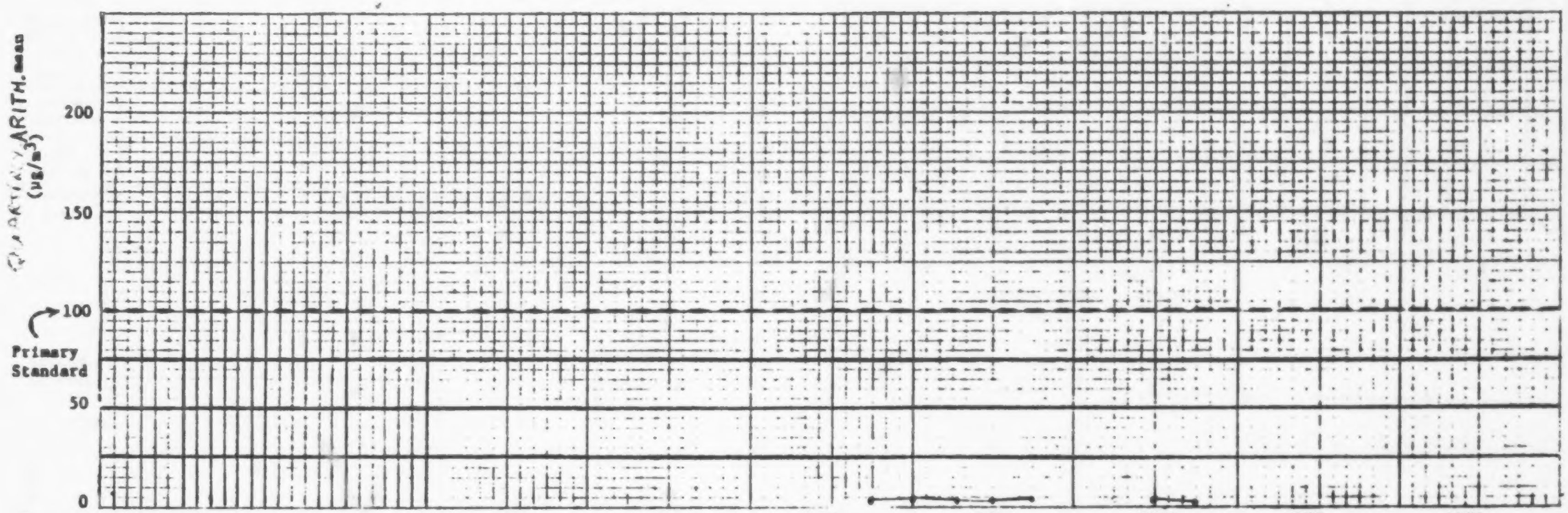
Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			3	15	14	14	10	0	0	4	11	5																								
MAXIMUM 24hr (µg/m³)			3	87	32	40	18			3	3	3																								
2ND MAX 24hr (µg/m³)			3	59	32	13	14			3	3	3																								
MAXIMUM 3hr (µg/m³)																																				
2ND MAX 3hr (µg/m³)																																				
QTR. ARITH MEAN (µg/m³)			3*	28	17	8	7			3*	3	3																								
No. of Obs. >365 µg/m³																																				
No. of Obs. >1300 µg/m³																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.4.1.9
NO2
bubbleR

Site Location: Buffalo, S.D.

Site Code: 430760001F03



Year	1970				1971				1972				1973			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
ARITH. Quarterly mean (µg/m³)																
No. of Obs >200 µg/m³																
No. of Obs >100 µg/m³																

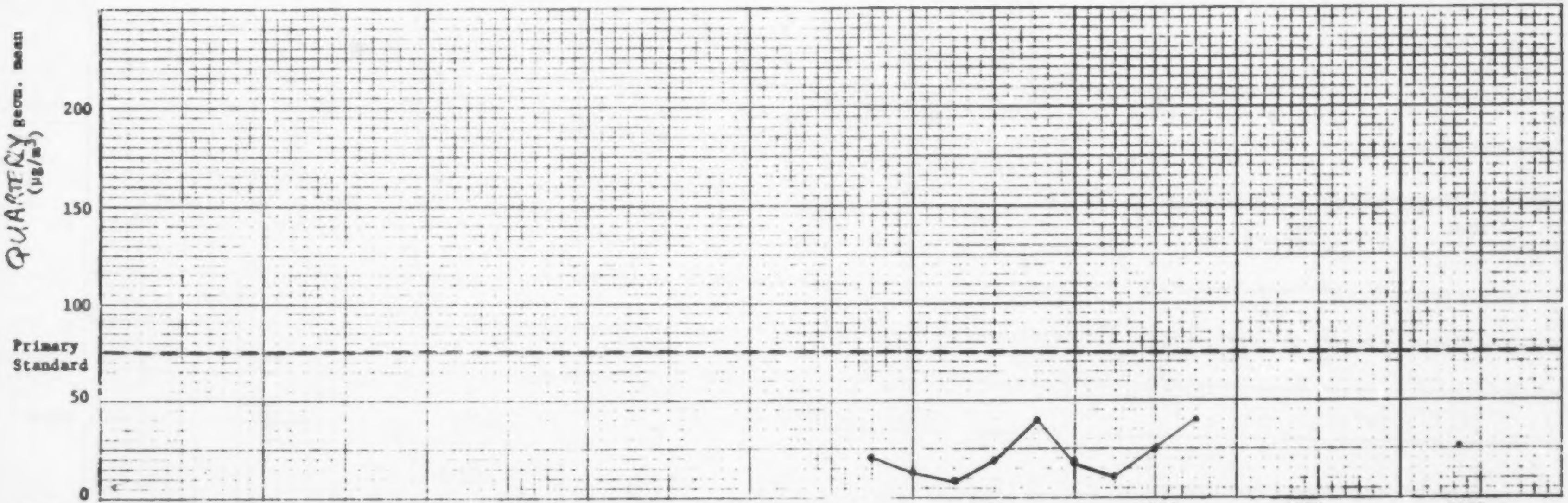
Year	1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			5	15	14	19	10	-	-	4	11									
Maximum (µg/m³)			6	13	5	7	11			7	9									
2nd Max. (µg/m³)			3	9	3	5	9			3	6									
ARITH. Quarterly mean (µg/m³)			3*	4	3	3	4			4*	3									
No. of Obs >200 µg/m³																				
No. of Obs >100 µg/m³																				

* Value derived from data which do not meet summarization criteria.

Fig 2.9.2.1
TSP

Site Location: Belle Fourche

Site Code: 430980001F03



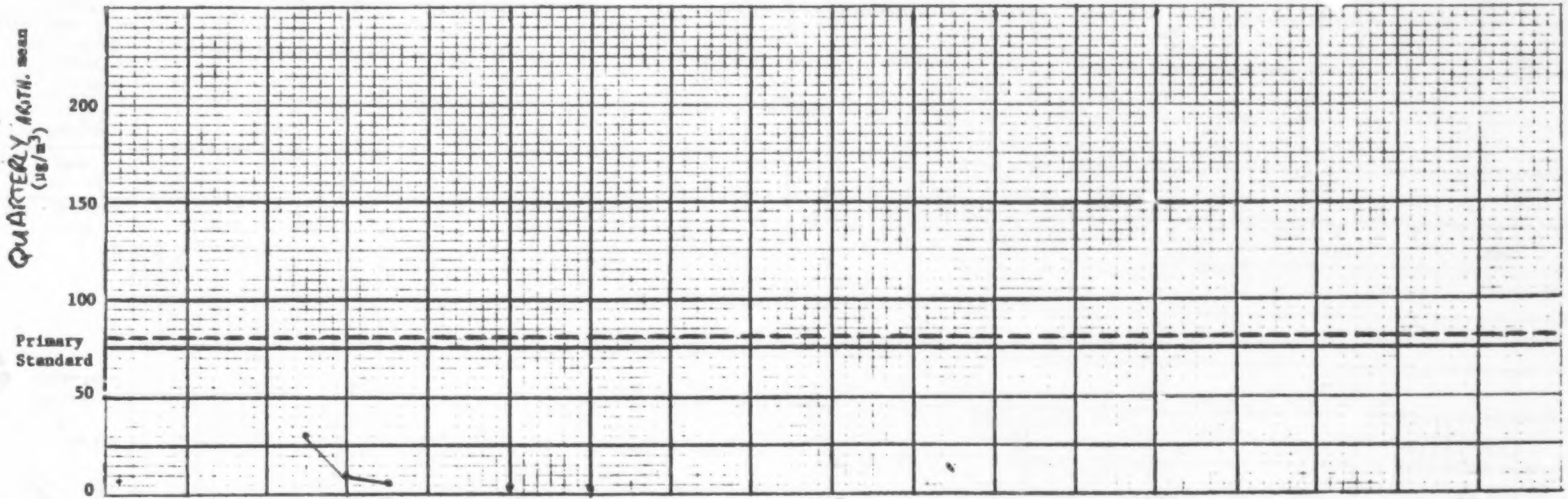
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			3	16	11	15	11	8	5	2	2									
Maximum (µg/m³)																			32	56	17	44	61	39	29	38	46									
2nd Max. (µg/m³)																			25	31	15	36	55	33	17	19	36									
Quarterly geom. mean (µg/m³)																			21*	13	9	19	39	17	11	27*	41*									
No. of Obs >260 µg/m³																			-			-	-	-	-											
No. of Obs >150 µg/m³																						.	.	.	.											

* Value derived from data which do not meet summarization criteria.

Fig 2.9.2.2
SO_2
bubbler

Site Location: Belle Fourche

Site Code: 430980001F03



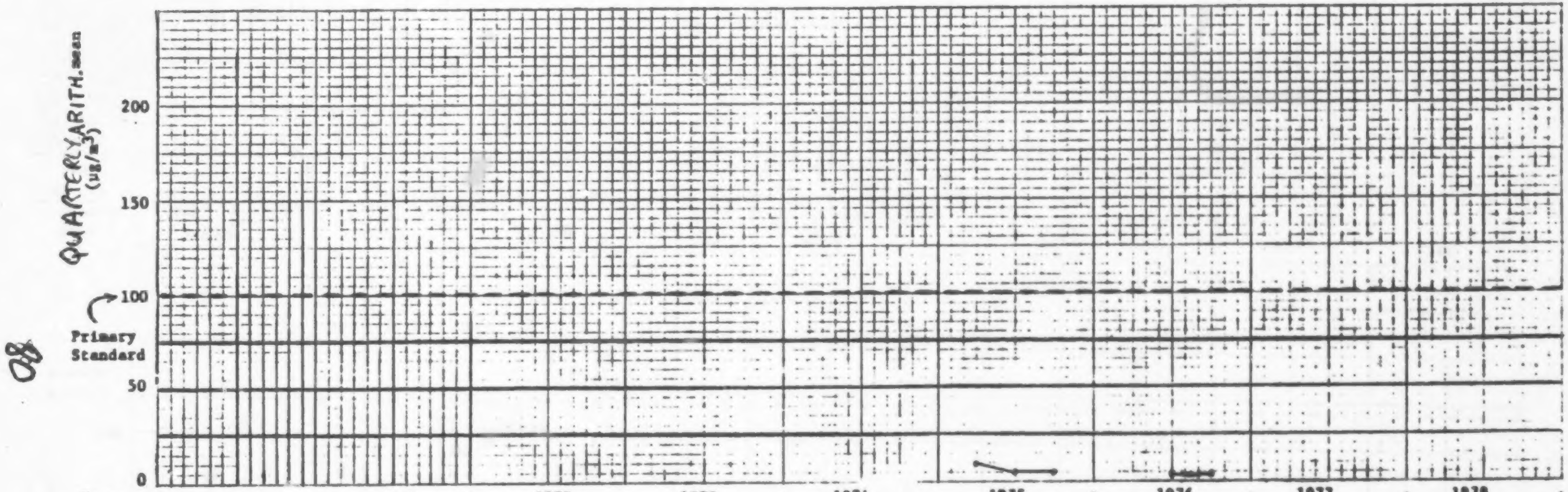
Year	1974				1975				1976				1977			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.					6	15	9	0	0	3	0	3				
MAXIMUM 24 hr (Mg/m³)					133	45	16			3		3				
2ND MAX 24 hr (Mg/m³)					18	17	9			3		3				
MAXIMUM 3 hr (Mg/m³)																
2ND MAX 3 hr (Mg/m³)																
QTR. ARITH MEAN (Mg/m³)					31	9	6			3		3				
No. of Obs. > 365 Mg/m³						-										
No. of Obs. > 1300 Mg/m³																

Year	1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				
MAXIMUM 24 hr (Mg/m³)																				
2ND MAX 24 hr (Mg/m³)																				
MAXIMUM 3 hr (Mg/m³)																				
2ND MAX 3 hr (Mg/m³)																				
QTR. ARITH MEAN (Mg/m³)																				
No. of Obs. > 365 Mg/m³																				
No. of Obs. > 1300 Mg/m³																				

Fig 2.4.2.3
NO2
bubbler

Site Location: Belle FOURCHE, S.D.

Site Code: 43098 0001F03

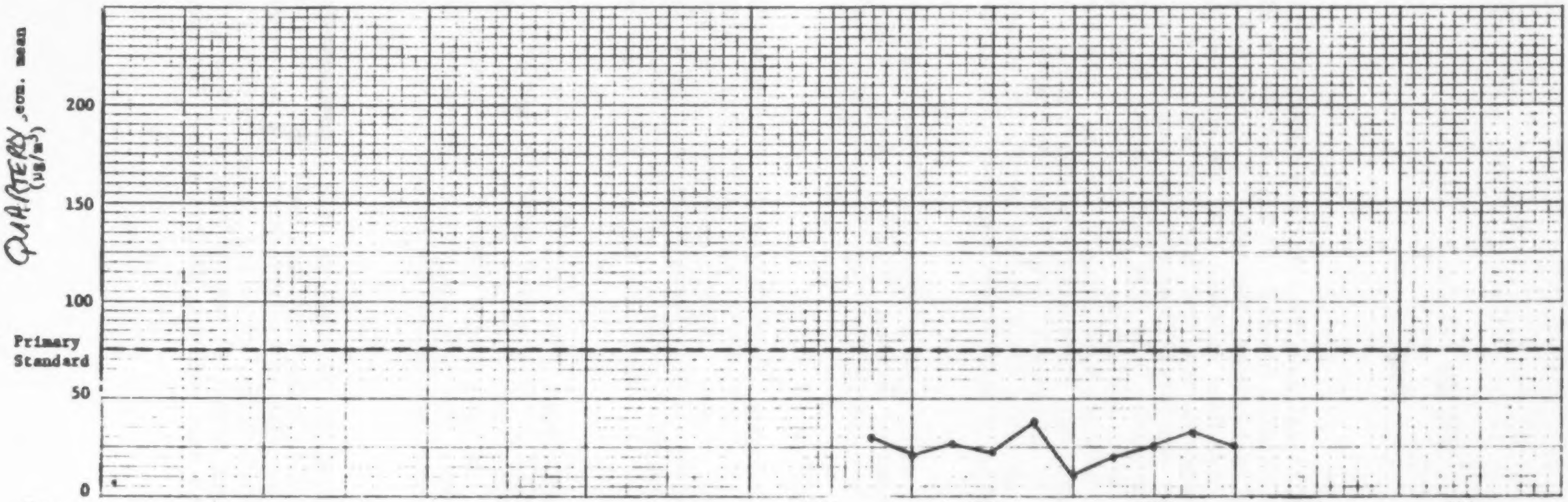


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																					6	15	9	0	0	3	3									
Maximum (μg/m³)																					21	13	9			5	3									
2nd Max. (μg/m³)																					18	10	8			3	3									
ARITH. Quarterly mean (μg/m³)																					9*	5	5			3*	3*									
No. of Obs >200 μg/m3																																				
No. of Obs >100 μg/m3																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.9.3
TSP

Site Location: LEMMON
Site Code: 431320001F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			5	14	15	15	12	13	7	9	9	12								
Maximum (µg/m³)																			86	229	140	65	77	53	94	97	51	53								
2nd Max. (µg/m³)																			28	65	65	56	72	28	23	51	49	41								
Quarterly geom. mean (µg/m³)																			30*	21	27	23	38	12	21	27	33	27								
No. of Obs >260 µg/m³																																				
No. of Obs >150 µg/m³																																				
No. of Obs/yr.																								55				35								

* Value derived from data which do not meet summarization criteria.

SECTION 2.5

UTAH

Utah will have eight sites operating that are funded by OEA in 1978. Nine sites were originally planned for Utah but due to site changes of planned energy development, the sampling sites have undergone modification. Data have been received from the Huntington, Castle Dale, Bullfrog Basin, Wahweap Marina, and Hurricane sites. All sites have current data thru 1st quarter 1977 except the site at Castle Dale. The sites at Hurricane and Castle Dale have just started to report data so only one quarter of data is available. The site at Vernal has started operation but no data has been reported as yet. The need for sites at Kanab and Escalante has diminished, therefore these sites will not be installed. The site at Caineville will be temporarily moved to Green River until a more suitable place can be found. An alternative Energy development site will be established near Nephi to begin in FY '78.

Additional sites included in this report are Price and Cedar City. While these sites are funded by Section 105 CAA, and not by OEA, they do represent areas that have energy development impact potential.

Total Suspended Particulate

Excursions of the secondary standard have occurred more than once per year at Wahweap, Bullfrog Basin, and Castle Dale. Single excursions per year of the primary standard were reported at Wahweap and Castle Dale. The highest 24 hour average was reported at Castle Dale, 665 ug/m^3, with a second high 24 hr. average value of 225 ug/m^3. Two quarters of data, third and fourth quarter of 1974, are missing from the Wahweap site.

The sites at Price and Cedar City both record TSP data since 1975. The Cedar City site has had multiple excursion per year of the secondary standard. The Price site had two excursions of the primary standard in 1976 and seven excursions of the standard in the first quarter of 1977 alone. Multiple excursions per year of the secondary standard have been recorded at the Price site.

Sulfur Dioxide

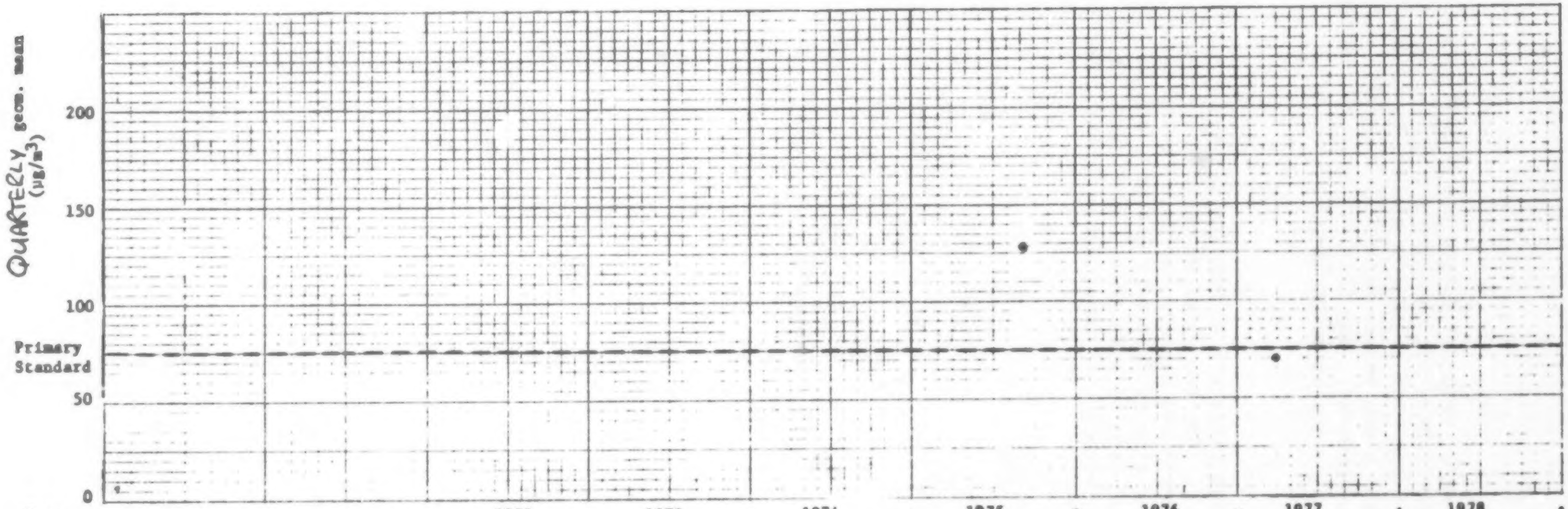
All eight OEA funded in FY '78 sites in Utah are or will be monitoring for sulfur dioxide using continous monitors. The data reported at present has recorded no violations nor any excursions of any NAAQS. The site at Cedar City, while not funded by OEA, is located in an area that has potential energy impacts. Many violations of the NAAQS for SO_2 have been reported at this site. Ten excursions of the 24 hour standard were recorded during the second quarter of 1976 alone. Annual averages have not exceeded the NAAQS, however. The probable reason for these high values is thought to be due to the monitor being located near a new school heating plant which burns fuel with a rather high sulfur content. Due to these source oriented problems the Cedar City site may be relocated.

Nitrogen Oxides

Six of the OEA funded sites are to measure oxides of nitrogen using continuous monitors. The two sites where only TSP and SO_2 are monitored are Bullforg Basin and Wahweap Marina. At present NO_x data is only recorded from the site at Hurricane and only one quarter, first quarter of 1977, of data is available. No excursions of the NAAQS are recorded at Hurricane. NO_x monitoring at the other sites should begin presently.

Fig 2.5.1.1
TSP

Site Location: CASTLE DALE, UT.
Site Code: 460280004 F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																													21							
Maximum ($\mu g/m^3$)																													665							
2nd Max. ($\mu g/m^3$)																													225							
Quarterly geom. mean ($\mu g/m^3$)																													70*							
No. of Obs >260 $\mu g/m^3$																													1							
No. of Obs >150 $\mu g/m^3$																													3							

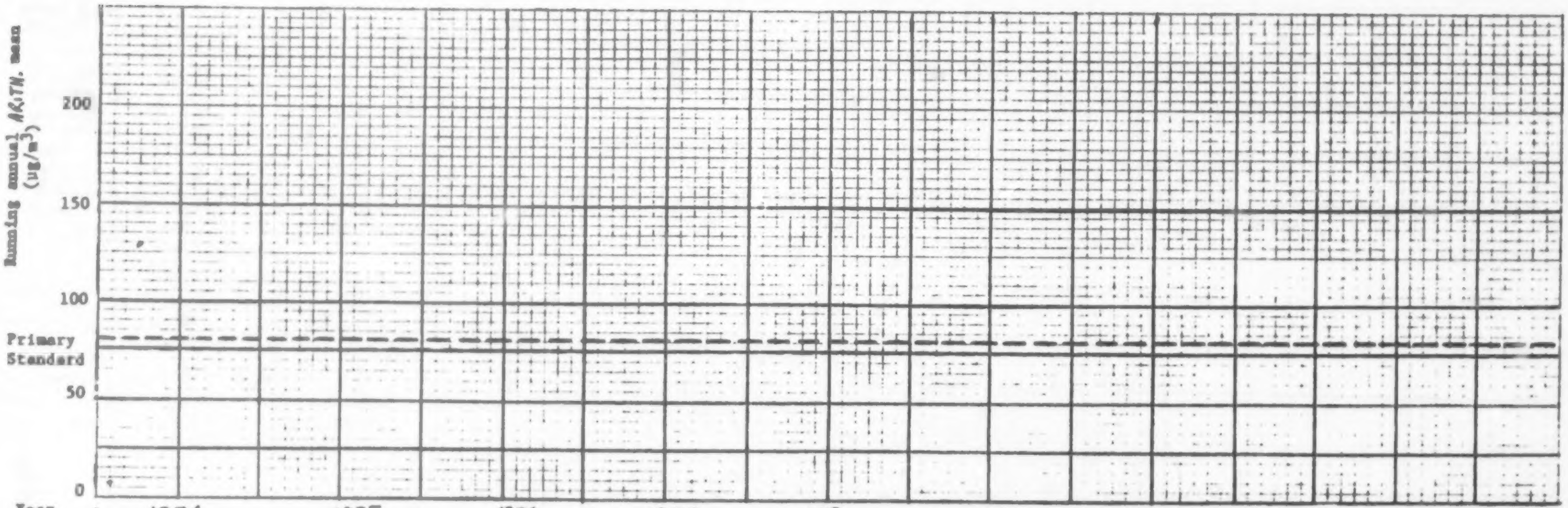
* Value derived from data which do not meet summarization criteria.

Fig 2.5.1.2

SO$_2$

Site Location: Castle Dale, Utah

Site Code: 460280009F03



Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.													288																							
MAXIMUM 24 hr ($\mu g/m^3$)													3																							
2ND MAX 24 hr ($\mu g/m^3$)													3																							
MAXIMUM 3 hr ($\mu g/m^3$)													3																							
2ND MAX 3 hr ($\mu g/m^3$)													3																							
QTR. ARITH MEAN ($\mu g/m^3$)													3*																							
No. of Obs. > 365 $\mu g/m^3$													-																							
No. of Obs. > 1300 $\mu g/m^3$																																				

* Value derived from data which do not meet summarization criteria.

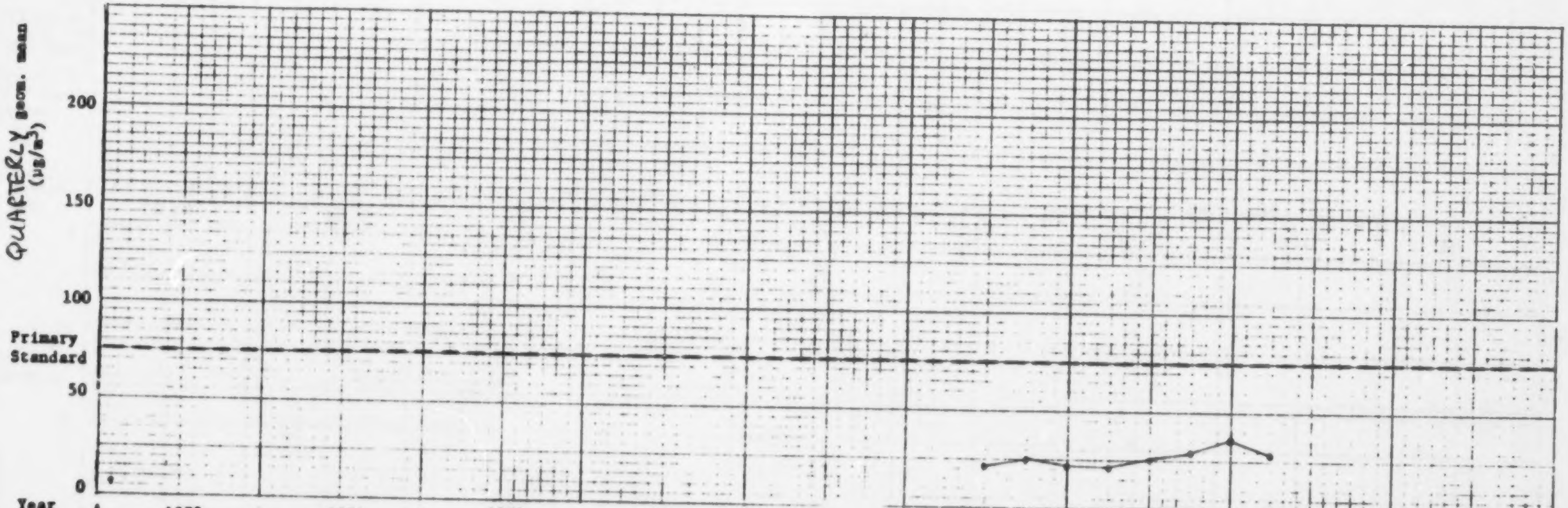
Fig 2.5.2.1

TSP

Site Location: HUNTINGTON, UT

Site Code: 460140001F02

98

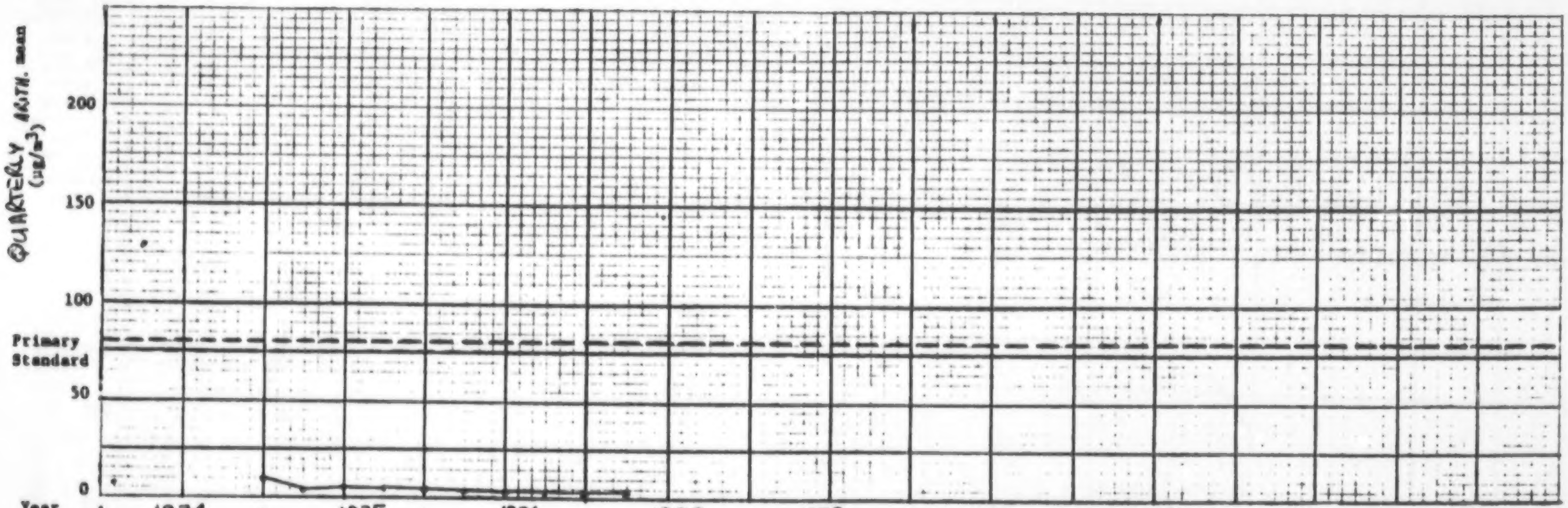


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																						81	90	89	89	66	85	76	77							
Maximum (µg/m³)																						191	98	98	79	65	58	126	140							
2nd Max. (µg/m³)																						80	70	98	65	57	53	93	133							
Quarterly geom. mean (µg/m³)																						23	25	23	21	26	23	36	29							
No. of Obs >260 µg/m³																						-														
No. of Obs >150 µg/m³																						1														

* Value derived from data which do not meet summarization criteria.

Fig 2.5.2.2
SO_2
CONTINOUS

Site Location: HUNTINGTON, UT.
Site Code: 960140001F02

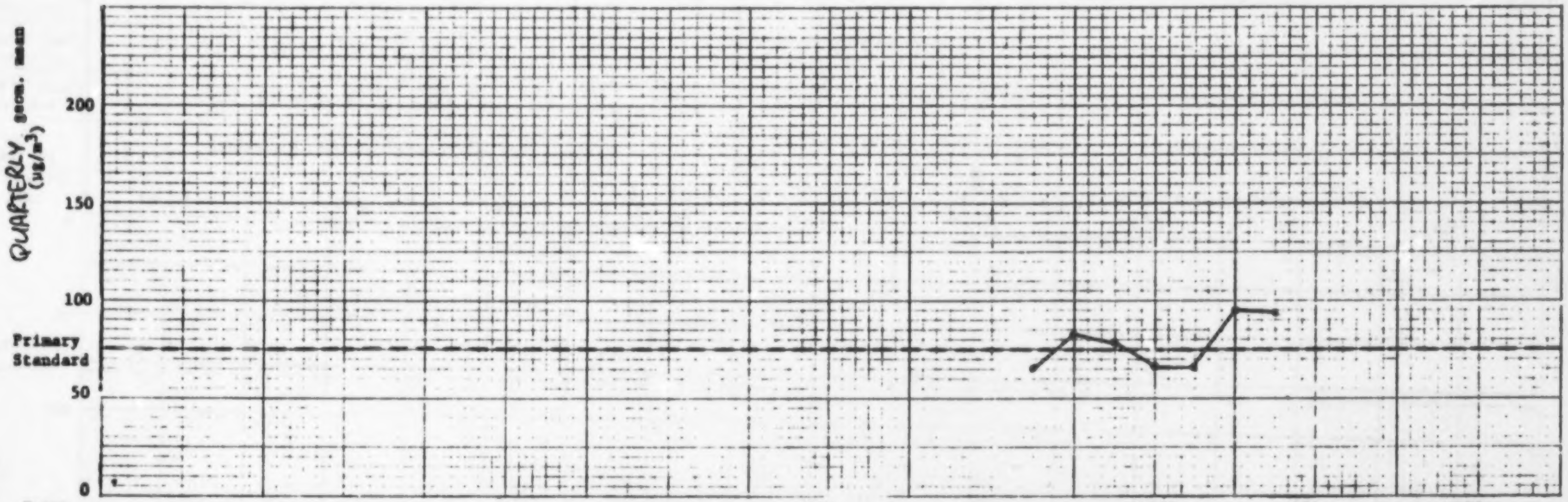


Year Quarter	1974 1	1974 2	1974 3	1974 4	1975 1	1975 2	1975 3	1975 4	1976 1	1976 2	1976 3	1976 4	1977 1	1977 2	1977 3	1977 4	1978 1	1978 2	1978 3	1978 4	1979 1	1979 2	1979 3	1979 4	1980 1	1980 2	1980 3	1980 4	1981 1	1981 2	1981 3	1981 4	1982 1	1982 2	1982 3	1982 4
No. of Obs.				599	299	659	621	2124	2076	1724	2074	2183	2127																							
MAXIMUM 24 hr (Mg/m³)				91	12	97	14	27	20	9	5	3	3																							
2ND MAX 24hr (Mg/m³)				21	10	19	12	25	11	8	5	3	3																							
MAXIMUM 3 hr (Mg/m³)				52	26	271	36	52	53	61	18	3	3																							
2ND MAX 3hr (Mg/m³)				52	26	97	35	52	45	36	18	3	3																							
QTR. ARITH MEAN (Mg/m³)				10*	4*	6*	5*	4	9	3	3	3	3																							
No. of Obs. >365 Mg/m³																																				
No. of Obs. >1300 Mg/m³																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.5.3.1
TSP

Site Location: PRICE, UT.
Site Code: 460780001F01



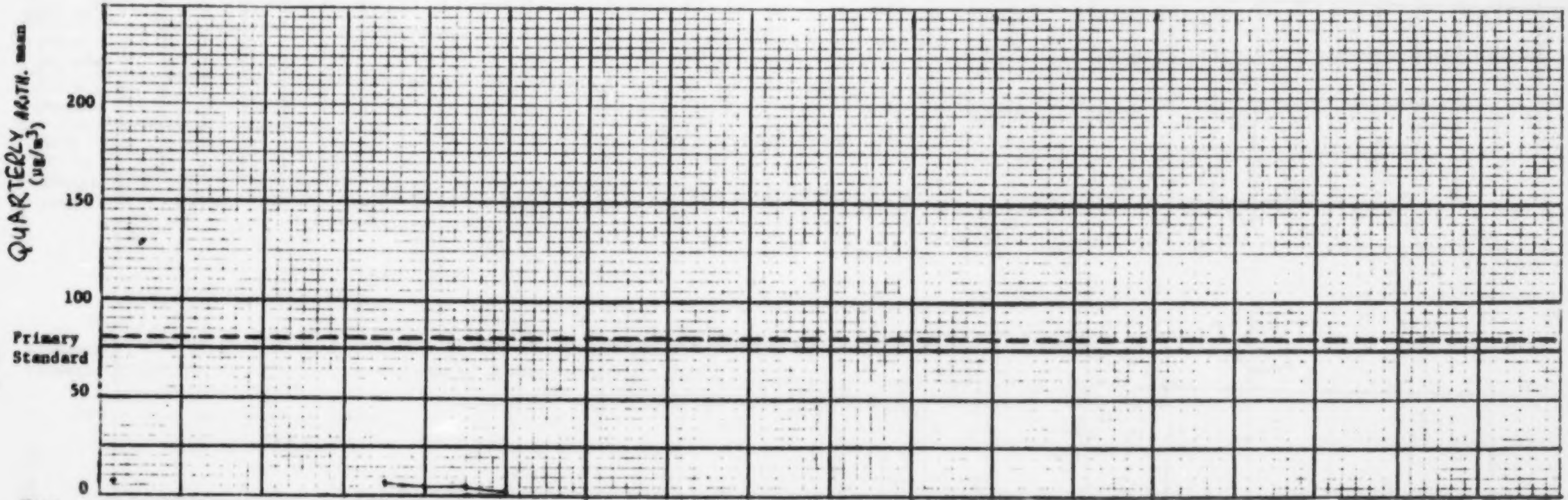
Year	1970				1971				1972				1973				1974			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				
Maximum (µg/m³)																				
2nd Max. (µg/m³)																				
Quarterly geom. mean (µg/m³)																				
No. of Obs >260 µg/m³																				
No. of Obs >150 µg/m³																				

Year	1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			82	85	83	63	89	92	82							
Maximum (µg/m³)			140	185	186	258	116	396	406							
2nd Max. (µg/m³)			134	179	178	228	111	267	396							
Quarterly geom. mean (µg/m³)			66	83	78	67	66	95	94							
No. of Obs >260 µg/m³			-	-	-	-	-	2	7							
No. of Obs >150 µg/m³			·	10	7	3	-	10	12							

* Value derived from data which do not meet summarization criteria.

Fig 2.5.3.2
SO_2
CONTINOUS

Site Location: PRICE, Ut.
Site Code: 460780001F01

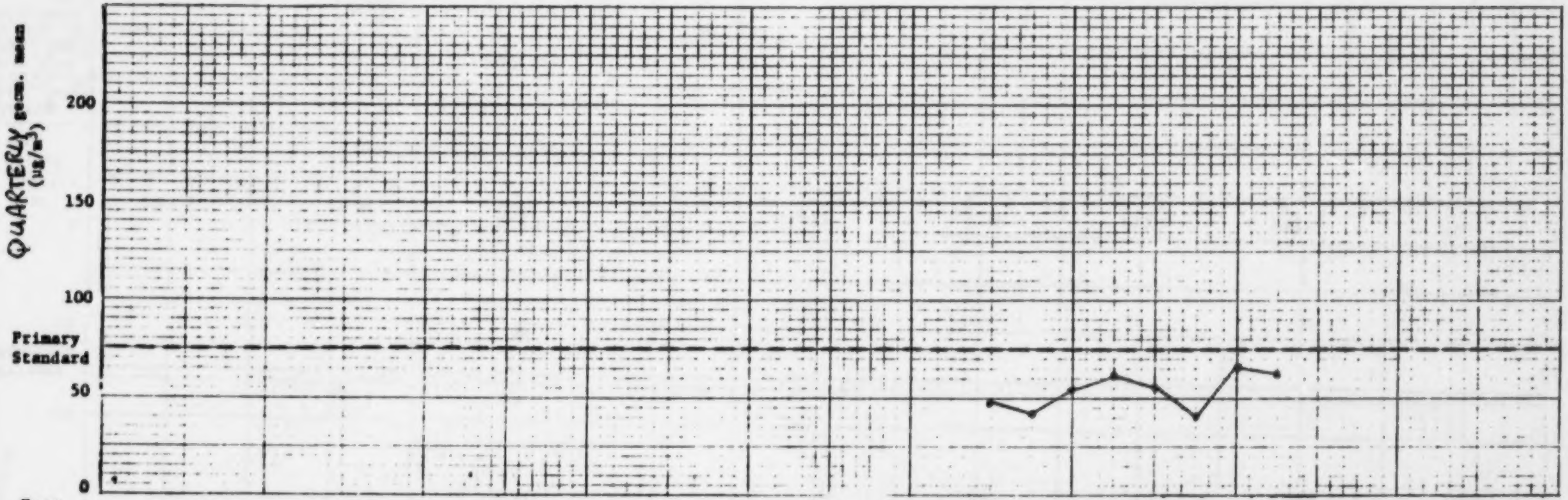


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.							1248	2125	2157	1706	2050	1723	1310																							
MAXIMUM 24 hr ($\mu g/m^3$)							27	26	19	14	58	43	34																							
2ND MAX 24 hr ($\mu g/m^3$)							24	24	17	13	46	41	26																							
MAXIMUM 3 hr ($\mu g/m^3$)							70	122	61	44	79	87	70																							
2ND MAX 3 hr ($\mu g/m^3$)							70	87	44	35	70	79	61																							
QTR. ARITH MEAN ($\mu g/m^3$)							7*	5	6	3	6	10	8*																							
No. of Obs. > 365 $\mu g/m^3$																																				
No. of Obs. > 1300 $\mu g/m^3$																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.5.9.1
TSP

Site Location: CEDAR CITY, UT.
Site Code: 460160001F01

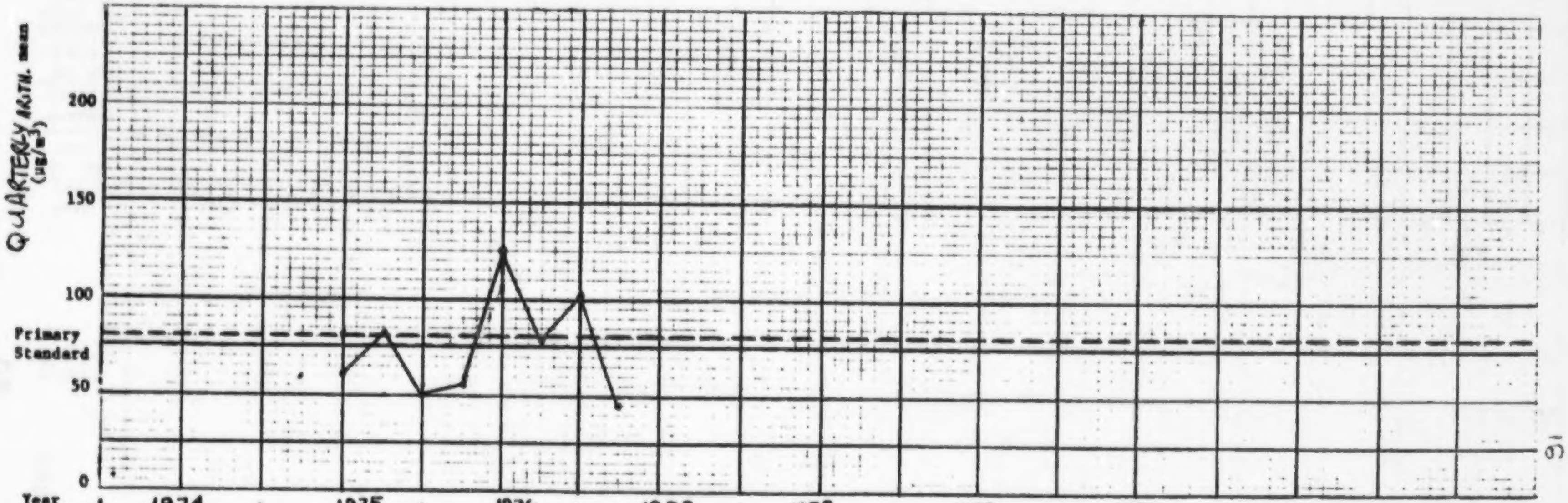


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																						84	82	61	62	25	50	62	32							
Maximum (µg/m³)																						226	102	176	189	109	72	119	151							
2nd Max. (µg/m³)																						149	85	137	170	106	69	112	117							
Quarterly geom. mean (µg/m³)																						49	43	59	63	55	41	66	63							
No. of Obs >260 µg/m³																						-	-	-	-	-	-	-	-							
No. of Obs >150 µg/m³																						1	0	1	2	0	-	-	1							

* Value derived from data which do not meet summarization criteria.

Fig 2.5.4.2
SO_2
CONTINOUS

Site Location: CEDAR CITY, UT.
Site Code: 460160001 F01

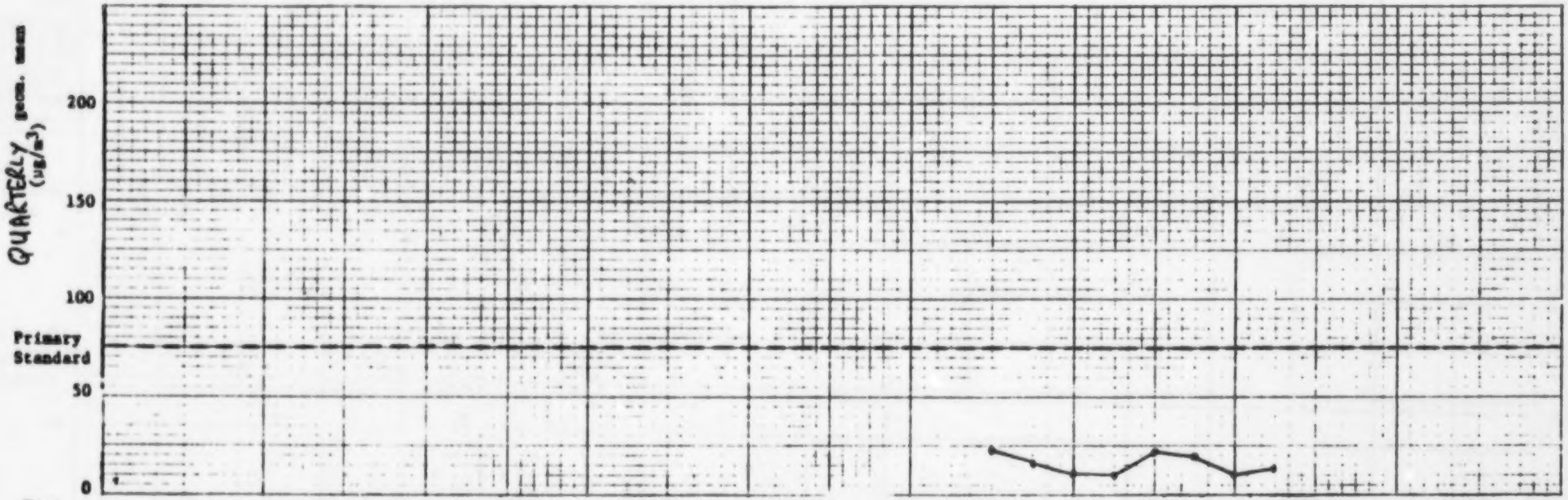


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.						1343	765	1302	1239	2042	1228	703	1574																							
MAXIMUM 24 hr (μg/m³)						275	278	403	560	582	480	768	473																							
2ND MAX 24 hr (μg/m³)						269	243	260	355	538	432	494	296																							
MAXIMUM 3 hr (μg/m³)						891	576	1092	1395	1608	908	1546	1092																							
2ND MAX 3 hr (μg/m³)						699	576	993	1240	1694	847	1520	924																							
QTR. ARITH MEAN (μg/m³)						65*	82*	50*	56*	126	79*	102*	95*																							
No. of Obs. > 365 μg/m³						-	-	1	1	10	2	3	-																							
No. of Obs. > 1300 μg/m³						-	-	-	1	6	-	3	-																							

* value derived from data which do not meet summarization criteria.

Fig 2.5.5.1
TSP

Site Location: Bullfrog Basin, Ut.
Site Code: 460400001F03

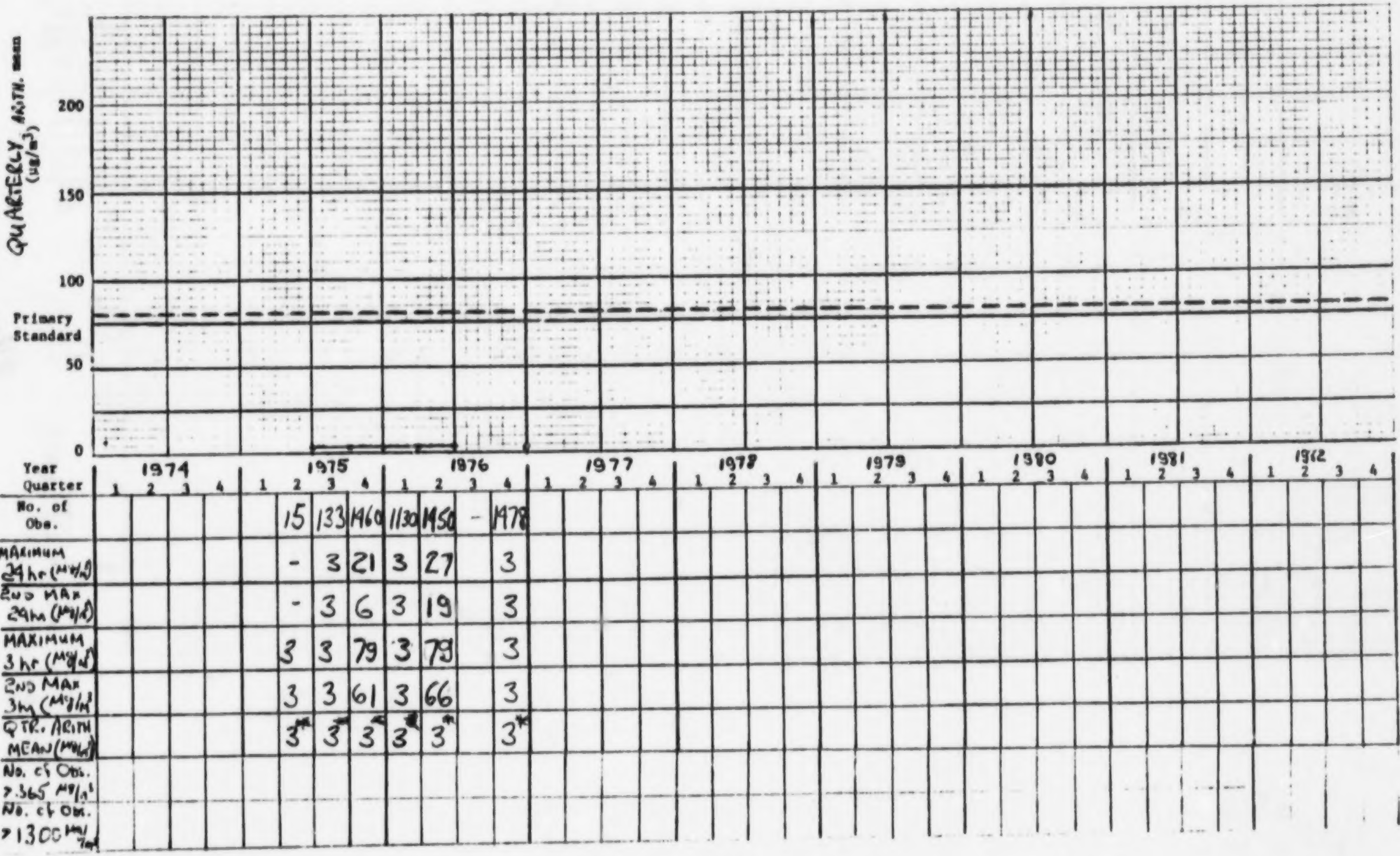


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																						19	79	74	53	56	74	74	73							
Maximum (µg/m³)																						151	183	79	108	120	76	39	236							
2nd Max. (µg/m³)																						64	95	60	84	115	73	36	172							
Quarterly geom. mean (µg/m³)																						23*	16	11	10	23	19	11	13							
No. of Obs >260 µg/m³																						-	-	-	-	-	-	-	-							
No. of Obs >150 µg/m³																						1	1	-	-	-	-	-	2							

* value derived from data which do not meet summarization criteria.

Fig 2.5.5.2
SO_2
CONTINOUS

Site Location: BULLFROG BASIN, UT.
Site Code: 46090000 1F03

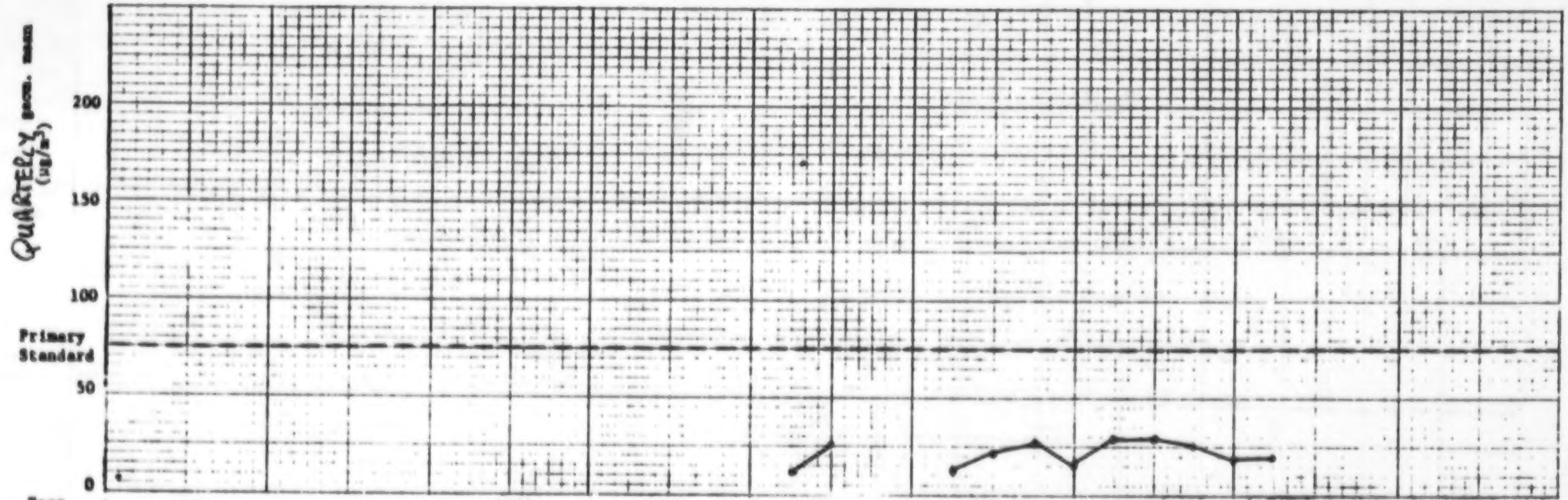


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.						15	133	1460	1130	1450	-	1478																								
MAXIMUM 24 hr ($\mu g/m^3$)						-	3	21	3	27		3																								
2ND MAX 24 hr ($\mu g/m^3$)						-	3	6	3	19		3																								
MAXIMUM 3 hr ($\mu g/m^3$)						3	3	79	3	79		3																								
2ND MAX 3 hr ($\mu g/m^3$)						3	3	61	3	66		3																								
QTR. ARITH MEAN ($\mu g/m^3$)						3*	3*	3*	3*	3*		3*																								
No. of Obs. > 365 $\mu g/m^3$																																				
No. of Obs. > 1300 $\mu g/m^3$																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.5.6.1
TSP

Site Location: WAHWEAP MARINA, UT.
Site Code: 4604000002F03

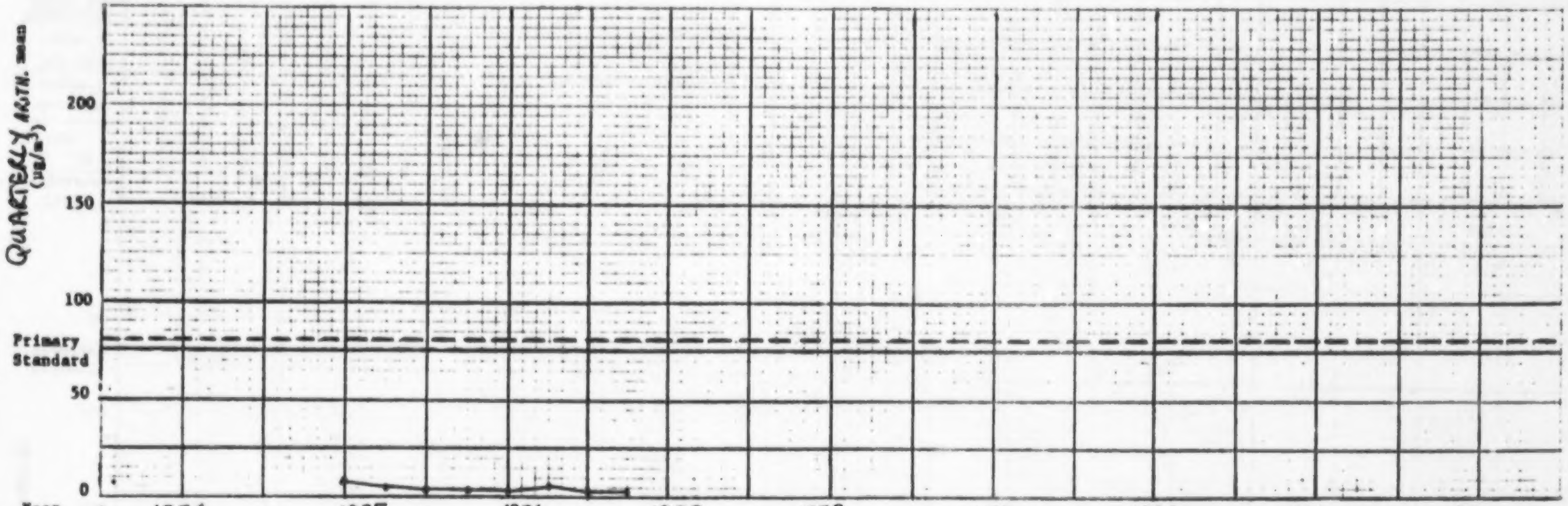


Year Quarter	1970 1	1970 2	1970 3	1970 4	1971 1	1971 2	1971 3	1971 4	1972 1	1972 2	1972 3	1972 4	1973 1	1973 2	1973 3	1973 4	1974 1	1974 2	1974 3	1974 4	1975 1	1975 2	1975 3	1975 4	1976 1	1976 2	1976 3	1976 4	1977 1	1977 2	1977 3	1977 4	1978 1	1978 2	1978 3	1978 4
No. of Obs.																	55	13	-	-	76	59	58	16	18	38	56	76	77							
Maximum (µg/m³)																	99	81			342	111	65	27	114	70	118	97	322							
2nd Max. (µg/m³)																	79	68			175	109	63	26	68	63	84	36	187							
Quarterly geom. mean (µg/m³)																	12	27*			13	23	27	15	29*	28	26	18	20							
No. of Obs >260 µg/m³																	·	·			1	·	·		·	·	-	-	1							
No. of Obs >150 µg/m³																	·				2	·	-	-			-	-	3							

* Value derived from data which do not meet summarization criteria.

Fig 2.5.6.2
SO_2
CONTINOUS

Site Location: WAHWEAP MARINA, UT
Site Code: 460900002F03



Year / Quarter	1974 1	1974 2	1974 3	1974 4	1975 1	1975 2	1975 3	1975 4	1976 1	1976 2	1976 3	1976 4	1977 1	1977 2	1977 3	1977 4	1978 1	1978 2	1978 3	1978 4	1979 1	1979 2	1979 3	1979 4	1980 1	1980 2	1980 3	1980 4	1981 1	1981 2	1981 3	1981 4	1982 1	1982 2	1982 3	1982 4
No. of Obs.						923	360	1723	1996	1410	2162	393	651																							
MAXIMUM 24 hr (µg/m³)						23	13	22	3	8	27	9	3																							
2ND MAX 24 hr (µg/m³)						22	9	16	3	8	26	4	3																							
MAXIMUM 3 hr (µg/m³)						35	62	87	3	35	105	26	3																							
2ND MAX 3 hr (µg/m³)						35	35	27	3	28	71	26	3																							
QTR. ARITH MEAN (µg/m³)						8*	5*	9	3	3*	6	3*	3*																							
No. of Obs. >365 µg/m³																																				
No. of Obs. >1300 µg/m³																																				

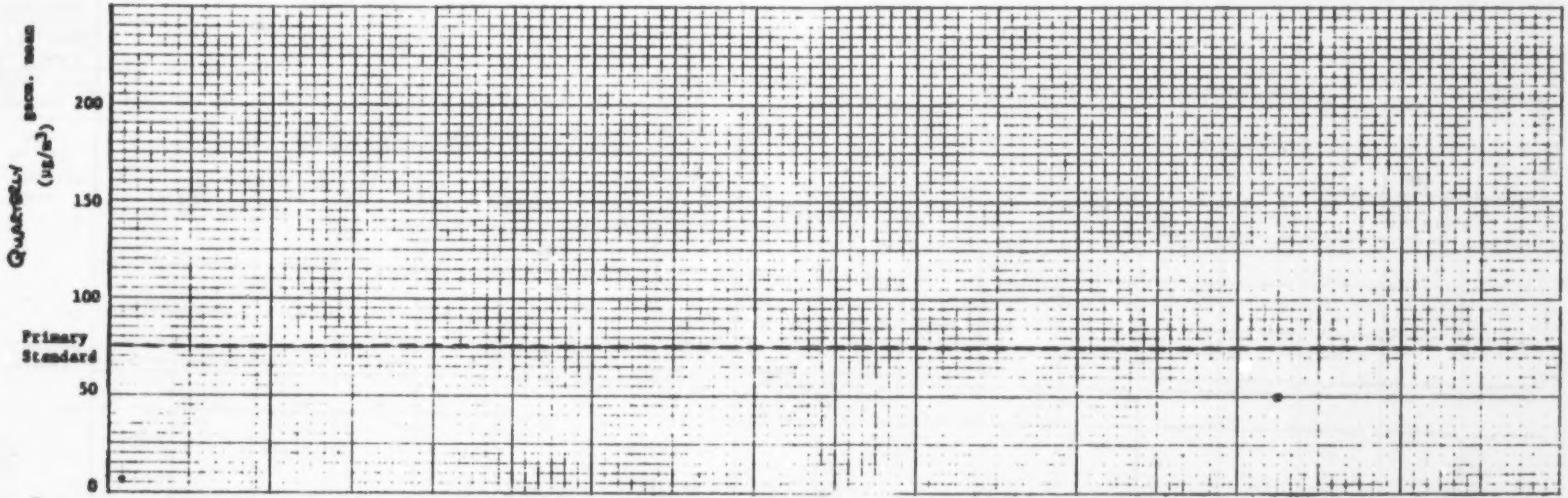
* Value derived from data which do not meet summarization criteria.

Fig 2.5.7.1

TSP

Site Location: HURRICANE, UT

Site Code: 461280003F02



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																													15							
Maximum (µg/m³)																													81							
2nd Max. (µg/m³)																													73							
Quarterly geom. mean (µg/m³)																													50							
No. of Obs >260 µg/m³																													-							
No. of Obs >150 µg/m³																													-							

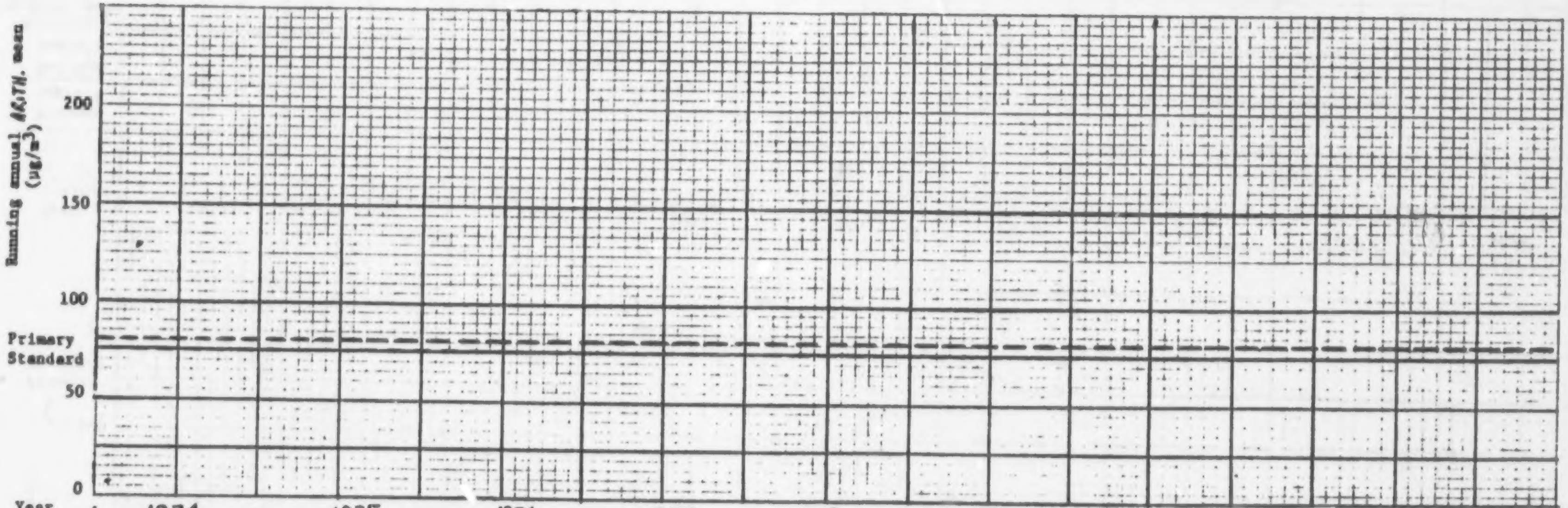
* Value derived from data which do not meet summarization criteria.

Fig 2.5.7.2 SO2

CONTINOUS

Site Location: HURRICANE, UT

Site Code: 461280003F02



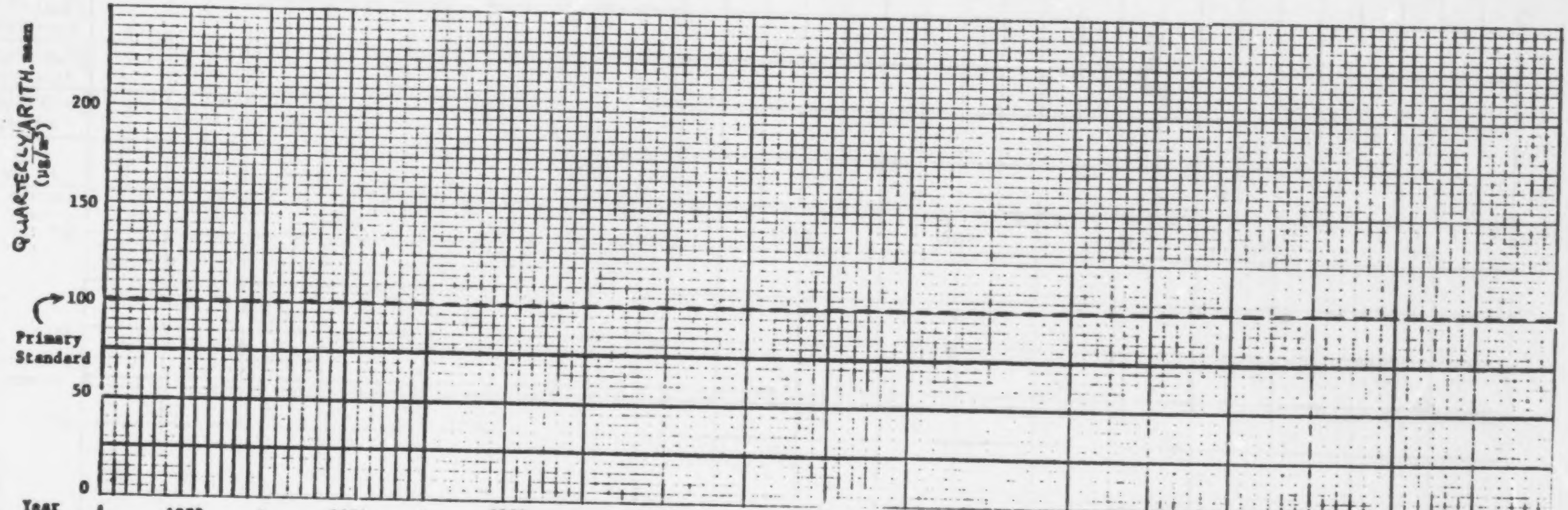
Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.													1125																							
MAXIMUM 24 hr (μg/m³)													7																							
2ND MAX 24 hr (μg/m³)													5																							
MAXIMUM 3 hr (μg/m³)													26																							
2ND MAX 3 hr (μg/m³)													18																							
QTR. ARITH MEAN (μg/m³)													3*																							
No. of Obs. >365 μg/m³													-																							
No. of Obs. >1300 μg/m³													-																							

* Value derived from data which do not meet summarization criteria.

Fig 2.5.7.3
NO$_2$
CONTINOUS

Site Location: HURRICANE, UTAH
Site Code: 461280003F02

98



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																													960							
Maximum (µg/m³)																													38							
2nd Max. (µg/m³)																													38							
ARITH. Quarterly mean (µg/m³)																													7*							
No. of Obs >200 µg/m³																													-							
No. of Obs >100 µg/m³																													-							

* Value derived from data which do not meet summarization criteria.

SECTION 2.6

WYOMING

The sites at Buffalo, Gillette, Lusk and New Castle are the original NGPRP sites established by PEDCo in 1974. Five other sites have since been added to the network (Bill, Kemmerer, Wheatland, Converse County, and Sweetwater County) and all nine sites are funded by OEA. Some changes will be made to the present network in FY '78 but none of the changes involve moving site locations. Continuous monitoring at the Gillette site will no longer be done. Only bubblers will be operated. The dual hi-vol at Lusk will be removed but particulate sampling at the Lusk site will still be conducted by the remaining hi-vol sampler. Four additional sites that are not funded by OEA but are located in possible energy impacted areas are included in this summary of data collected. Some violations of the NAAQS were recorded at these stations.

Total Suspended Particulate

Of the nine sites funded by OEA only the sites at New Castle and Wheatland recorded any excursions of the NAAQS for TSP. The primary and secondary standard were exceeded once each during the third quarter of 1975 at the New Castle site. A data anomaly report filed by the contractor operating the site at the time of the excursion of the primary standard ,277 ug/m^3, noted that while the sample is valid the construction at the airport where the sampler is located and the location of an asphalt batch plant very close to the sampler was the probable cause of the high reading. The sampler at Wheatland recorded one excursion of the secondary NAAQS during the third quarter of 1976. The Gillette station was moved during the third quarter of 1976 so there is less data from that site than would normally be reported.

Two of the additional TSP sites included in this report, but are funded under Section 105 of CAA, recorded violations and excursions of the NAAQS for TSP. The Rock Springs site is located in a community whose air quality has been influenced by population impacts attracted by energy and other development in the area. The 24 hour standard for TSP was violated in 1974 with seven excursions of the NAAQS. The secondary standard has been exceeded 43 times since the site began reporting data in 1974. The annual geometric mean has also violated the NAAQS for '74, '75 and '76. These violations of the annual geometric mean exceed the standard by about 20 ug/m^3 during each year of record. The site at Burks Ranch has had 3 excursions of the secondary standard since 1974.

Sulfur Dioxide

Six sites have SO_2 bubblers operating, five sites have reported data. Three sites have continuous SO_2 monitors. At this time only the Gillette site has reported data, but continuous monitoring at the Gillette site will not continue in FY '78. No violations of the NAAQS occurred at any site which monitors SO_2 . Maximum 24 hour values were less than 50 ug/m^3 and annual arithmetic means less than 5 ug/m^3.

Nitrogen Dioxide

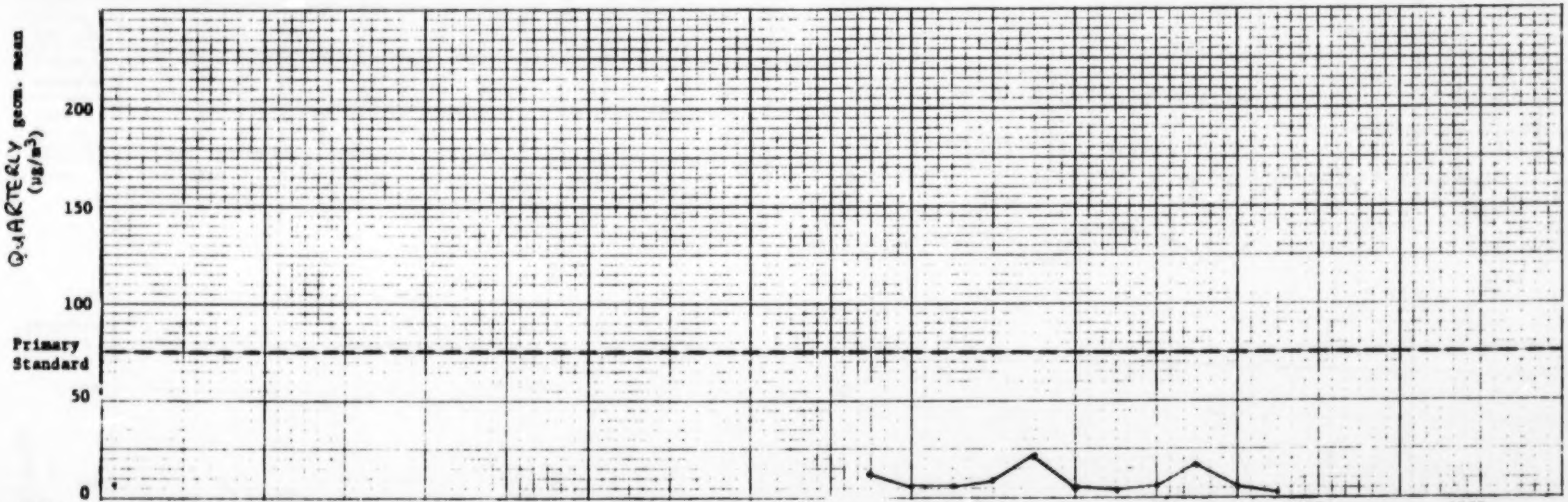
Six sites have NO_x bubblers operating, five sites have reported data. Three sites have continuous NO_x monitors. At this time only the Gillette site has reported data, but continuous monitoring at the Gillette site will not continue in FY '78. No violations of the NAAQS occurred at any site which monitors NO_x. The annual arithmetic mean values were less than 10 ug/m^3.

Ozone

The site at Gillette was to measure ozone concentrations using a continuous monitor. No data has been received from this site and since continuous monitoring activities at this site will be terminated at Gillette in FY '78 no ozone data may ever be gathered.

Fig 2.6.1
TSP

Site Location: BUFFALO, NY.
Site Code: 52006000IF03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			3	16	13	15	13	13	15	13	8	14	13							
Maximum (µg/m³)																			35	24	15	33	37	14	7	15	28	23	25							
2nd Max. (µg/m³)																			13	22	13	26	39	12	7	15	26	13	12							
Quarterly geom. mean (µg/m³)																			18*	6	6	13	23	6	4	6	17	6	2							
No. of Obs >260 µg/m³																			-	-		-	-	-	-	-	-	-								
No. of Obs >150 µg/m³																			-	-	-	-	-	-	-	-	-	-								
No. of Obs/yr.																								54				50								

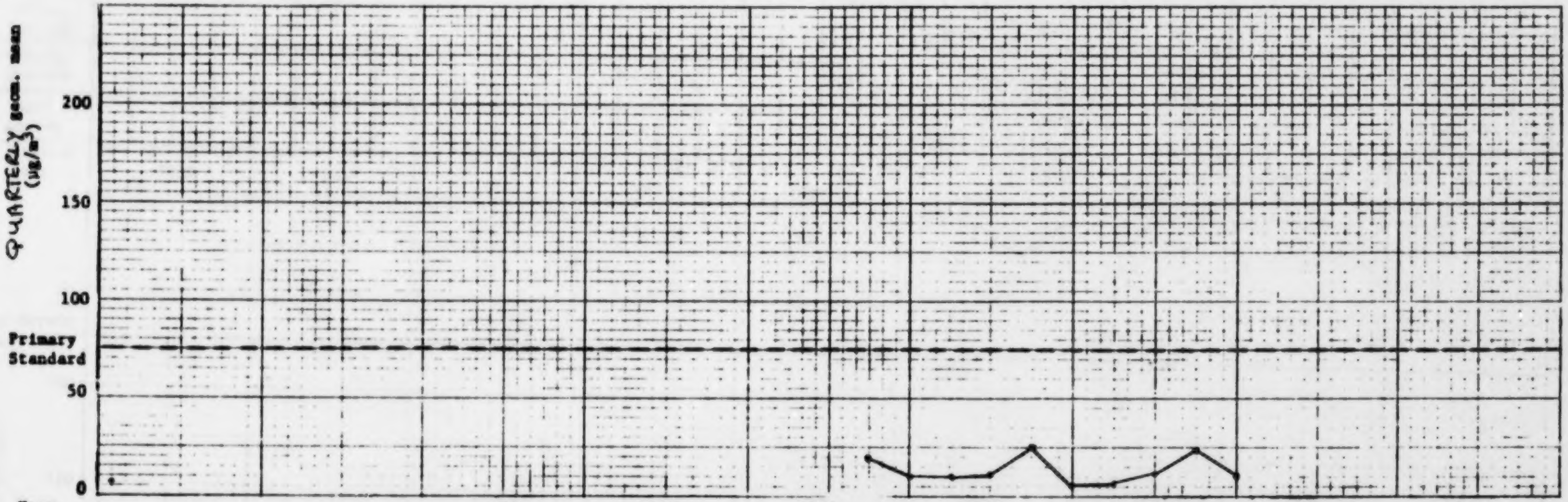
* Value derived from data which do not meet summarization criteria.

Fig 2.6.2.1

TSP

Site Location: GILLETTE, WY.

Site Code: 520080001F03



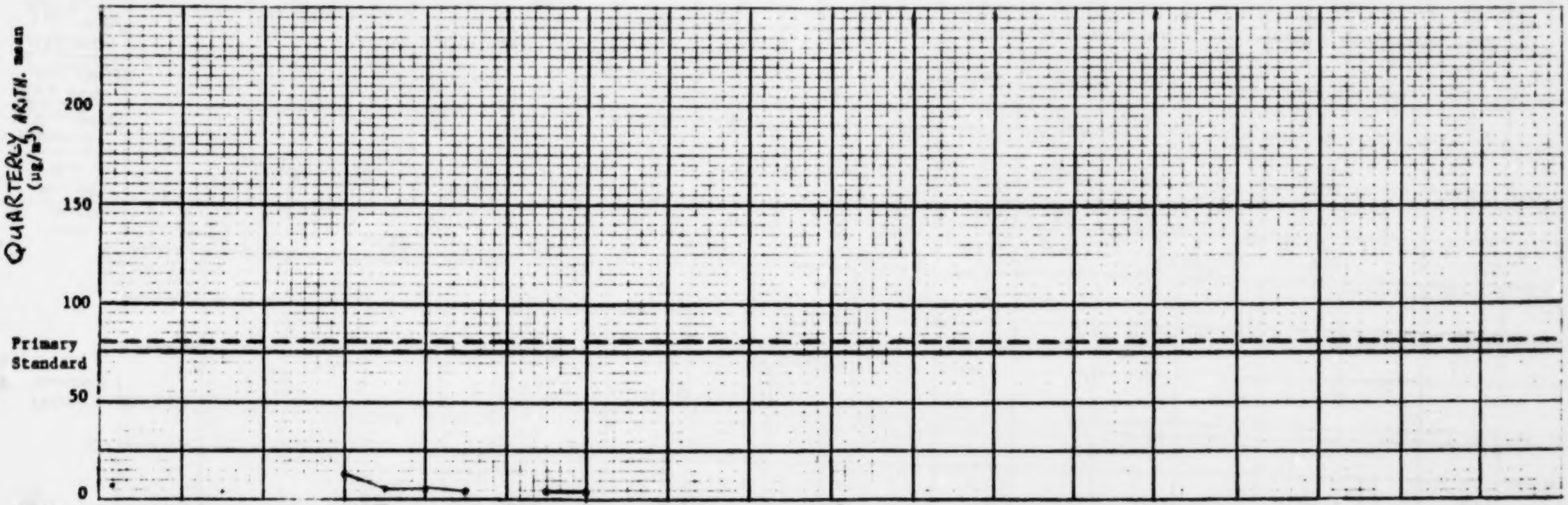
Year	1970				1971				1972				1973			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
Quarterly geom. mean (µg/m³)																
No. of Obs >260 µg/m³																
No. of Obs >150 µg/m³																
No. of Obs/yr.																

Year	1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			5	15	15	19	19	15	19	19	11	6								
Maximum (µg/m³)			40	30	63	29	59	20	12	36	43	14								
2nd Max. (µg/m³)			32	27	25	28	49	15	12	30	32	13								
Quarterly geom. mean (µg/m³)			*20	11	10	12	25	6	7	12	23	10								
No. of Obs >260 µg/m³			.			.	.	.	.	-	-	-								
No. of Obs >150 µg/m³			.			-	-	.	.	-	-	.								
No. of Obs/yr.								58				45								

* Value derived from data which do not meet summarization criteria.

Fig 2.6.2.2
SO_2
bubler

Site Location: Gillette, Wy.
Site Code: 520080001F03

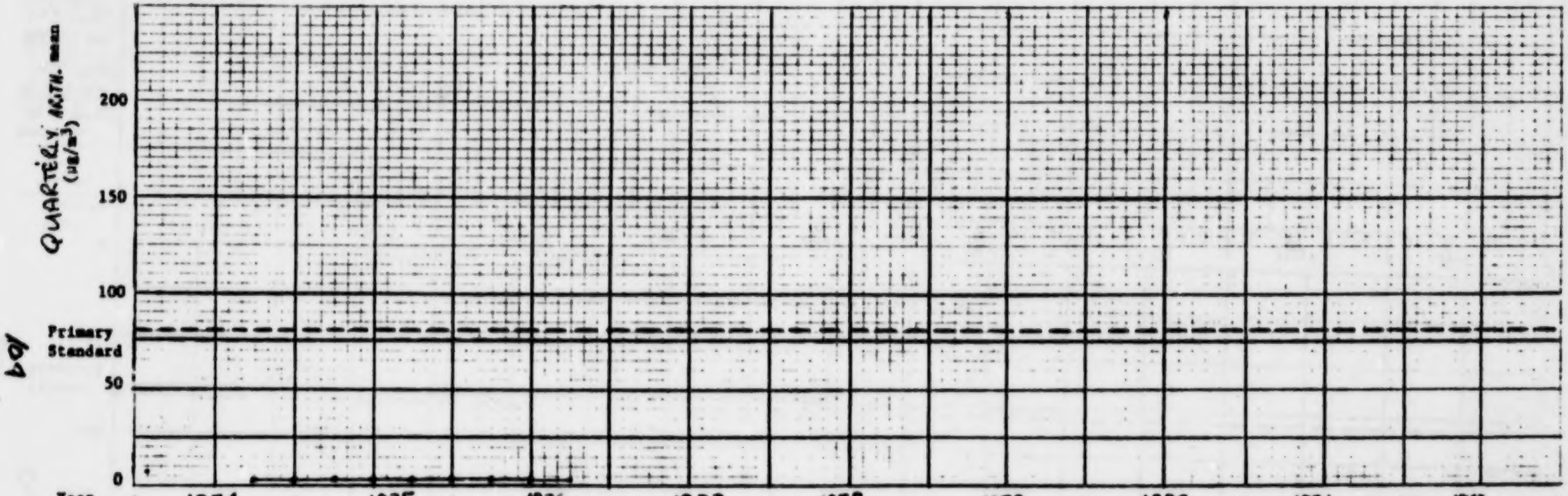


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.						15	11	8	11	-	3	4																								
MAXIMUM 24hr (µg/m³)						41	27	11	6		3	3																								
2ND MAX 24hr (µg/m³)						28	10	9	3		3	3																								
MAXIMUM 3hr (µg/m³)																																				
2ND MAX 3hr (µg/m³)																																				
QTR. ARITH MEAN (µg/m³)						10	5	5	3		3	3*																								
No. of Obs. >365 µg/m³						-	-		-		-	-																								
No. of Obs. >1300 µg/m³																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.6.2.3
SO$_2$
CONTINOU:

Site Location: GILLETTE, WY.
Site Code: 520080001F03

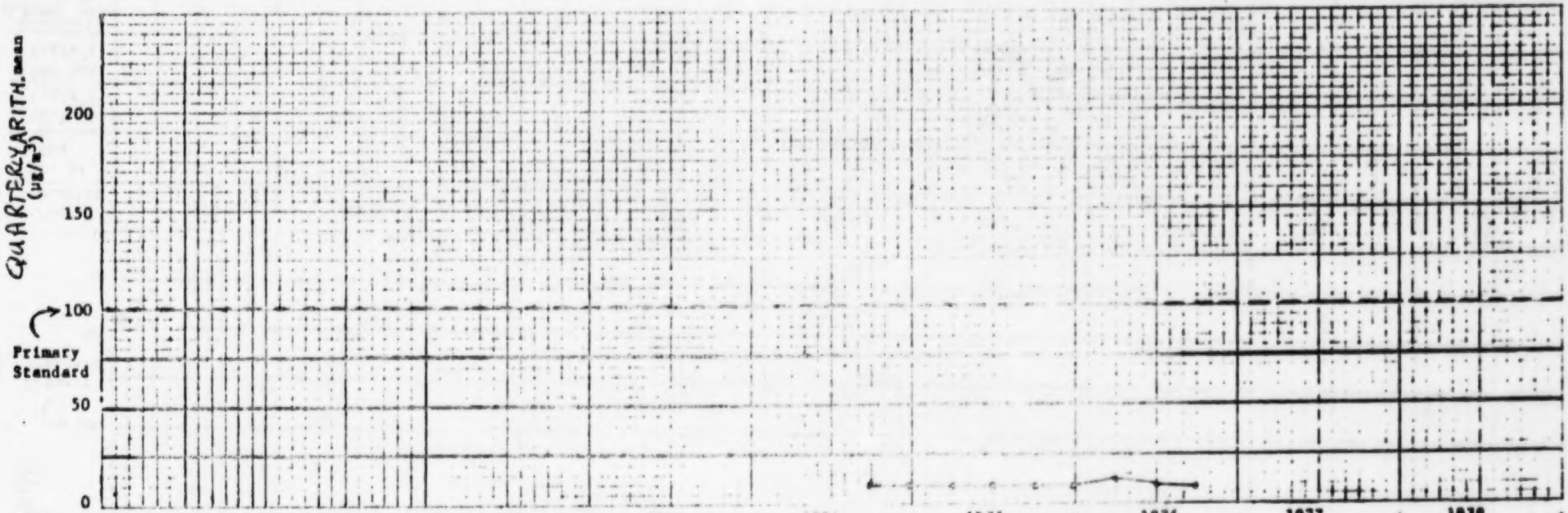


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.			571	1900	1765	2014	1779	2036	2199	2019	1763																									
MAXIMUM 24 hr (μg/m³)			13	17	13	3	36	6	3	66	14																									
2ND MAX 24 hr (μg/m³)			13	15	13	3	25	5	3	9	3																									
MAXIMUM 3 hr (μg/m³)			13	26	13	3	70	28	3	91	90																									
2ND MAX 3 hr (μg/m³)			13	26	13	3	52	19	3	41	3																									
QTR. ARITH MEAN (μg/m³)			3*	3	3	3	3	3	3	3	3																									
No. of Obs. >.365 μg/m³			-	-	-	-	-		-	-	-																									
No. of Obs. >1300 μg/m³			-						-	-	-																									

* Estimated or insufficient data.

Fig 2.6.2.4
NO$_2$
CONTINOUS
LYSHOW

Site Location: GILLETTE, Wy.
Site Code: 520080001F03

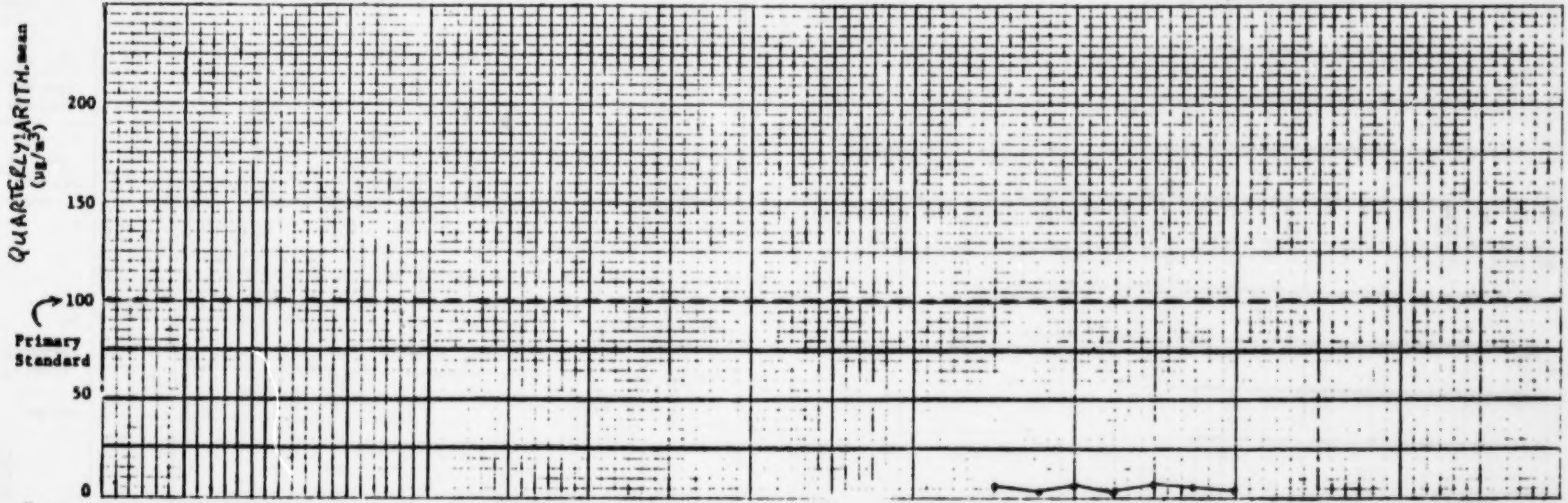


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			540	1710	1766	[illegible]	[illegible]	[illegible]	[illegible]	2012	1287									
1 hr Maximum (µg/m³)																			19	19	38	38	39	56	752	70	57									
1 hr 2nd Max. (µg/m³)																			19	19	38	38	75	56	752	58	23									
ARITH. Quarterly ~~Mean~~ mean (µg/m³)																			10*	10	10	10	10	10	13	10	3*									
No. of Obs >200 µg/m³																																				
No. of Obs >100 µg/m³																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.6.2.5
NO$_2$
bubbler

Site Location: GILLETTE, WY.
Site Code: 520080001F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																						15	11	8	12	14	8	4								
Maximum (µg/m³)																						19	8	19	9	12	8	7								
2nd Max. (µg/m³)																						19	6	8	3	11	7	3								
Quarterly ARITH. mean (µg/m³)																						6	9	6	3	7	5	4*								
No. of Obs >200 µg/m³																						-	-	-	-	-	-	-								
No. of Obs >100 µg/m³																						-	-	-	-	-	-	-								

* Value derived from data which do not meet summarization criteria.

Fig 2.6.3.1

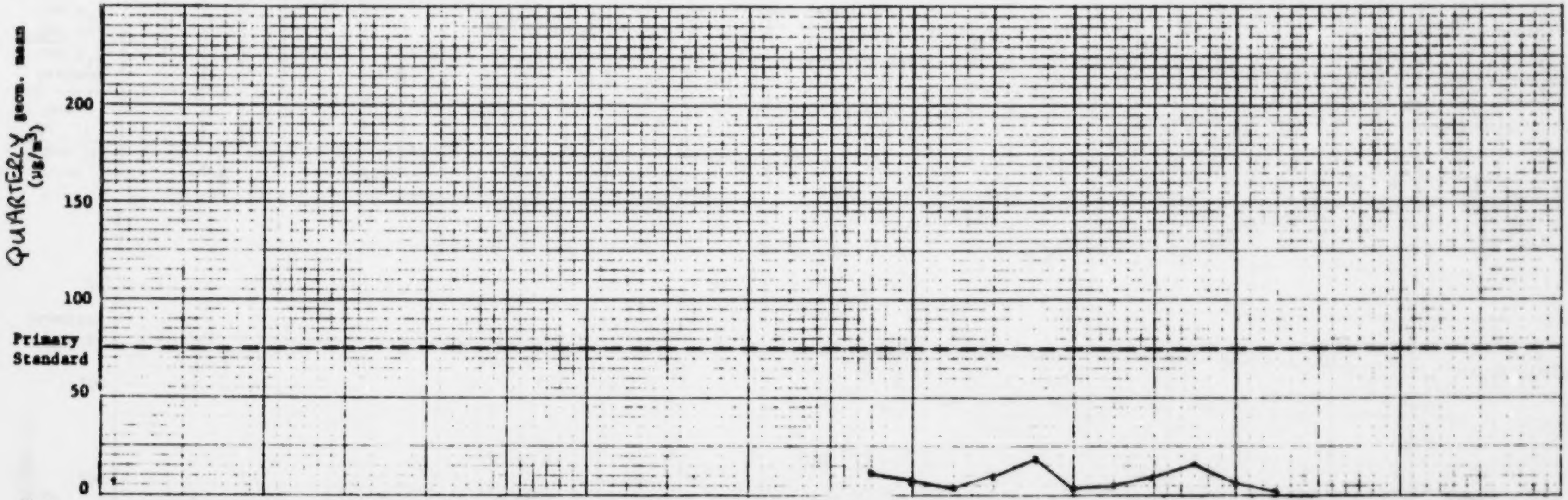
TSP

(DUAL SITE)

"A"

Site Location: Lusk, Wy.

Site Code: 520300001F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			5	15	14	19	19	11	13	11	12	8	12							
Maximum (µg/m³)																			29	30	28	89	93	19	20	42	96	18	43							
2nd Max. (µg/m³)																			23	29	18	16	40	19	16	33	30	16	9							
Quarterly geom. mean (µg/m³)																			12*	8	4	10	12	3	5	9	16	6	2							
No. of Obs >260 µg/m³																			-							-	-		-							
No. of Obs >150 µg/m³																			-							-			-							
No. of Obs/yr.																								53				44								

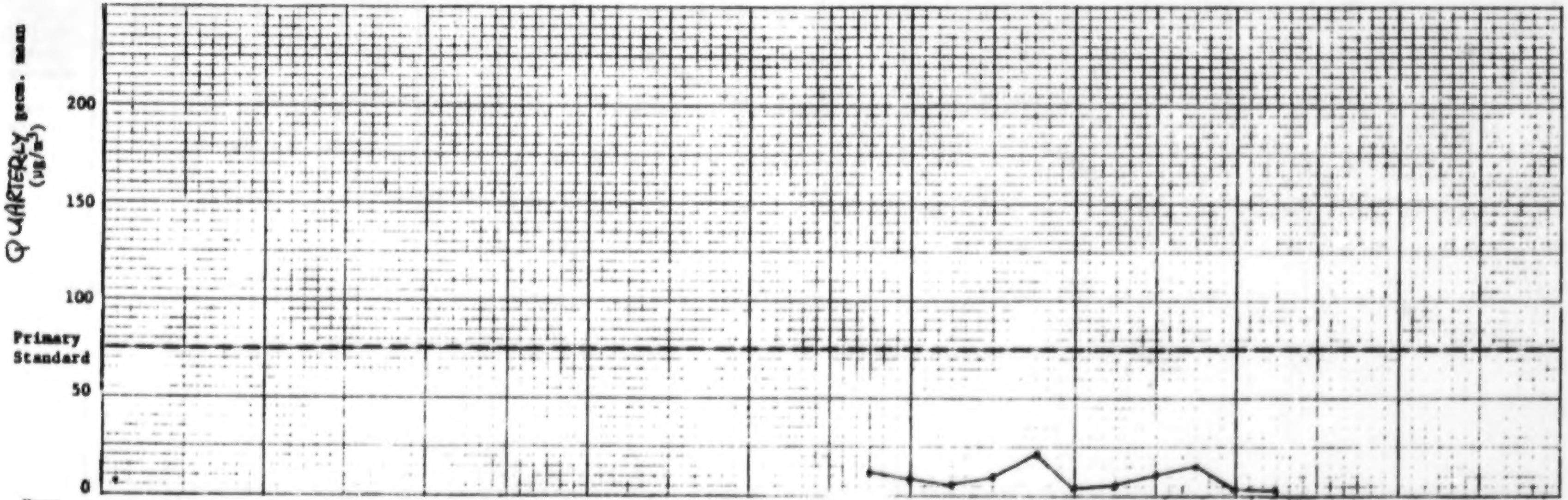
* Value derived from data which do not meet summarization criteria.

Fig 2.6.3.2
TSP
(DUAL SITE)

"B"

Site Location: Lusk, Wy.

Site Code: 520300002F03

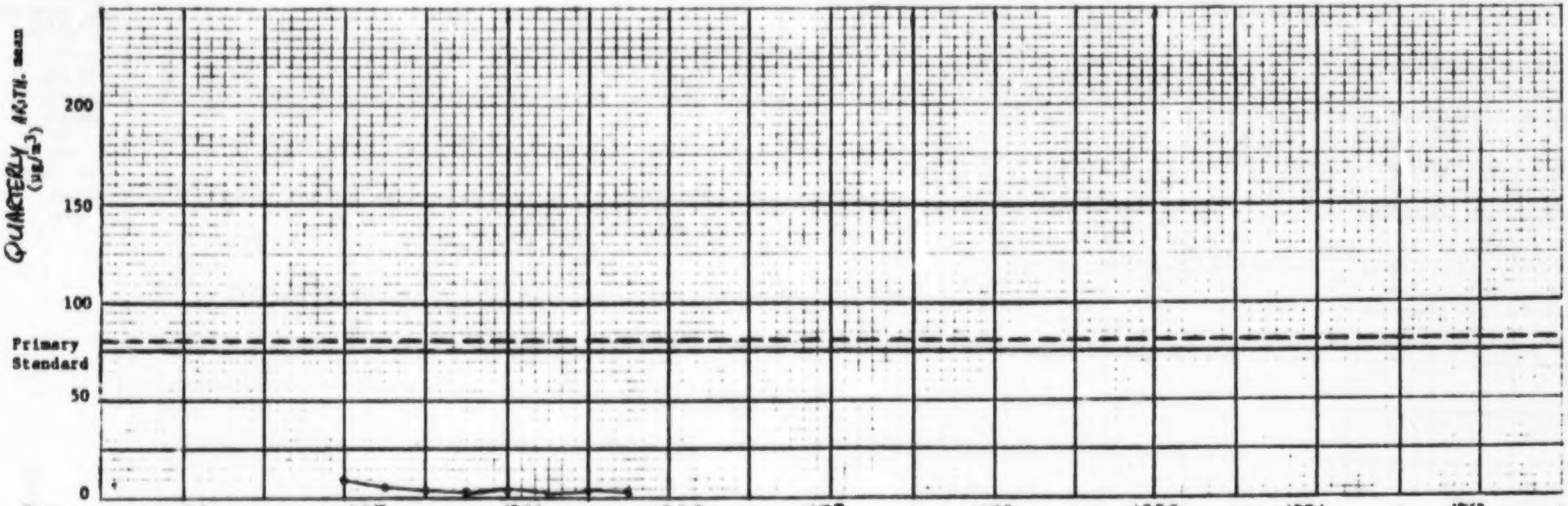


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			4	16	14	11	14	10	14	12	8	9	8							
Maximum (µg/m³)																			22	30	27	93	48	19	16	45	25	15	11							
2nd Max. (µg/m³)																			15	28	29	21	41	19	15	44	21	11	8							
Quarterly geom. mean (µg/m³)																			12*	8	5	10	22	9	5	12	15	3	3							
No. of Obs >260 µg/m³																			-	-	-	-	-	-	-	-	-	-	-							
No. of Obs >150 µg/m³																				-		-	-	-	-	-	-	-	-							
No. of Obs/yr.																								49				43								

* Value derived from data which do not meet summarization criteria

Fig 2.6.3.3
SO_2
bubbler

Site Location: Lusk, Wy.
Site Code: 520300001F03

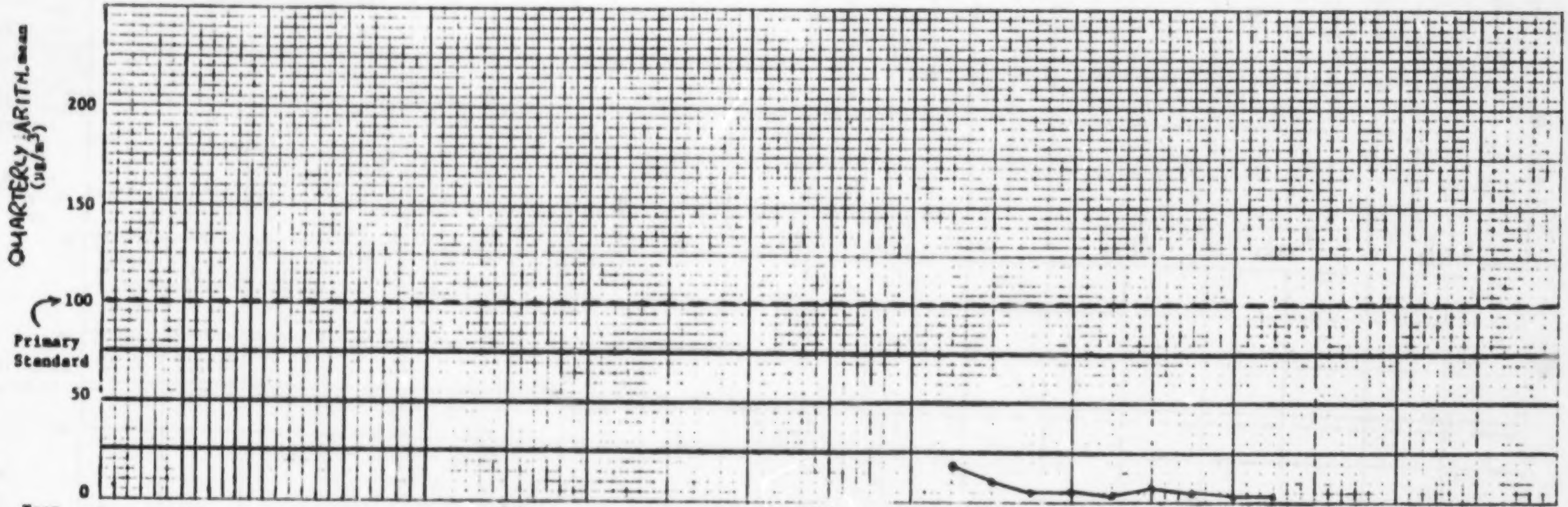


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.					4	15	11	6	9	13	13	12	11																							
MAXIMUM 24 hr ($\mu g/m^3$)					60	52	16	9	6	9	3	16	3																							
2ND MAX 24 hr ($\mu g/m^3$)					26	13	11	7	5	7	3	10	3																							
MAXIMUM 3 hr ($\mu g/m^3$)																																				
2ND MAX 3 hr ($\mu g/m^3$)																																				
QTR. ARITH MEAN ($\mu g/m^3$)					26*	10	6	5	3	4	3	4	3																							
No. of Obs. > 365 $\mu g/m^3$						-	-	-	-	-	-	-	-																							
No. of Obs. > 1300 $\mu g/m^3$																																				
No. of Obs/yr.								36				47																								

* Value derived from data which do not meet summarization criteria.

Fig 2.6.3.4
NO_2
bubbler

Site Location: Lusk, Wy.
Site Code: 52030001F03



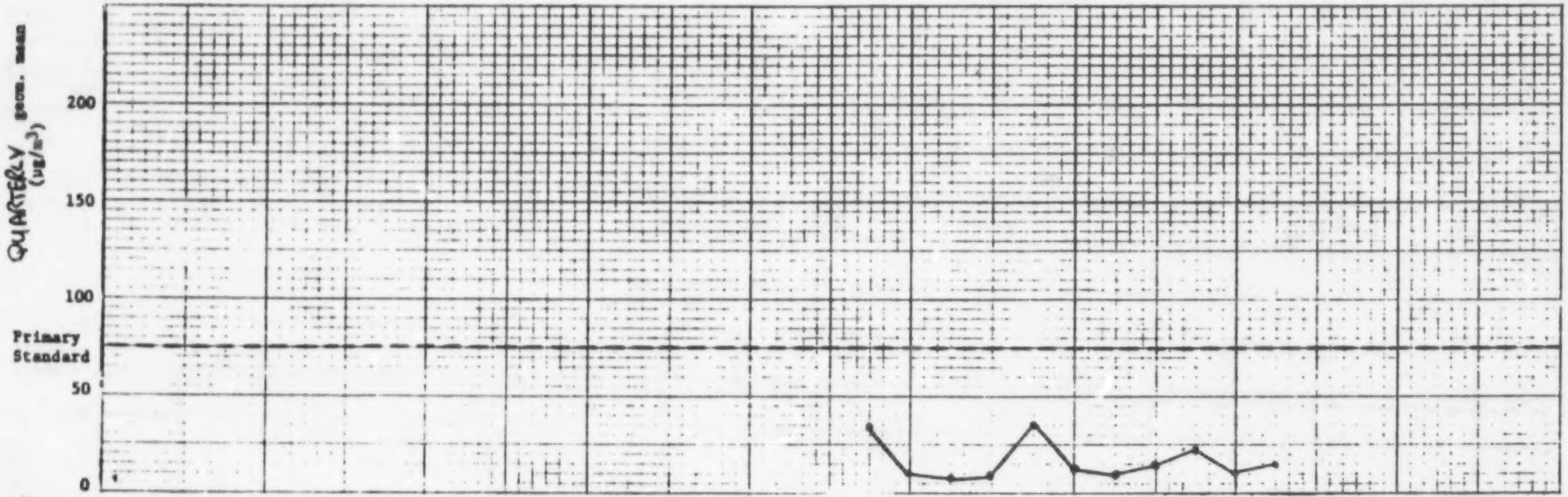
Year / Quarter	1970 1	1970 2	1970 3	1970 4	1971 1	1971 2	1971 3	1971 4	1972 1	1972 2	1972 3	1972 4	1973 1	1973 2	1973 3	1973 4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
ARITH. Quarterly ~~geom.~~ mean (µg/m³)																
No. of Obs >200 µg/m³																
No. of Obs >100 µg/m³																
No. of Obs/yr.																

Year / Quarter	1974 1	1974 2	1974 3	1974 4	1975 1	1975 2	1975 3	1975 4	1976 1	1976 2	1976 3	1976 4	1977 1	1977 2	1977 3	1977 4	1978 1	1978 2	1978 3	1978 4
No. of Obs.					4	15	14	5	7	14	12	12	11							
Maximum (µg/m³)					63	68	11	9	5	12	10	5	8							
2nd Max. (µg/m³)					3	36	11	7	5	10	10	5	6							
ARITH. Quarterly ~~geom.~~ mean (µg/m³)					18*	10	5	5	3	7	5	3	3							
No. of Obs >200 µg/m³						-	-	-												
No. of Obs >100 µg/m³																				
No. of Obs/yr.								38				45								

* Value derived from data which do not meet summarization criteria.

Fig 2.6.9.1
TSP

Site Location: Newcastle, Wy
Site Code: 520820001F03

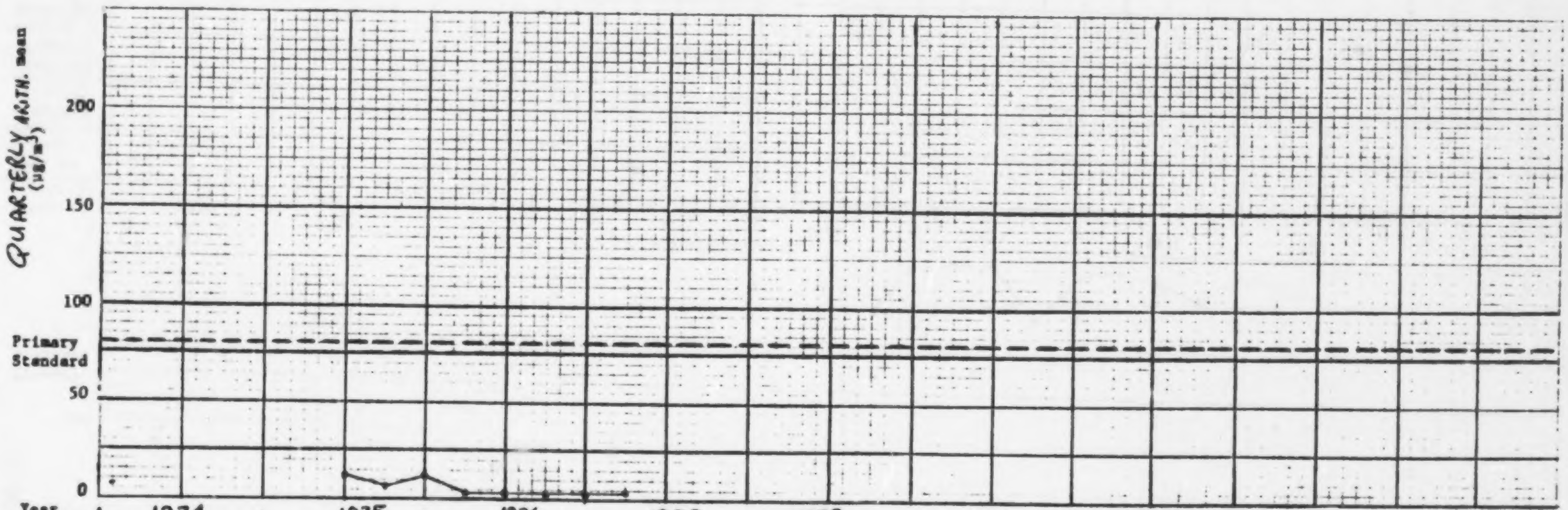


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																			2	16	14	15	15	14	13	15	19	19	15							
Maximum (µg/m3)																			43	44	24	51	277	31	25	52	85	28	73							
2nd Max. (µg/m3)																			36	40	13	25	135	23	19	35	38	19	37							
Quarterly geom. mean (µg/m3)																			39*	11	9	11	41	13	10	14	23	11	15							
No. of Obs >260 µg/m3																			-			-	1	-	-	-	-	-	-							
No. of Obs >150 µg/m3																			-			-	1		-	-	-	-	-							

* Value derived from data which do not meet summarization criteria.

Fig 2.6.9.2
SO_2
bubbler

Site Location: New Castle, Wy
Site Code: 520820001 F03



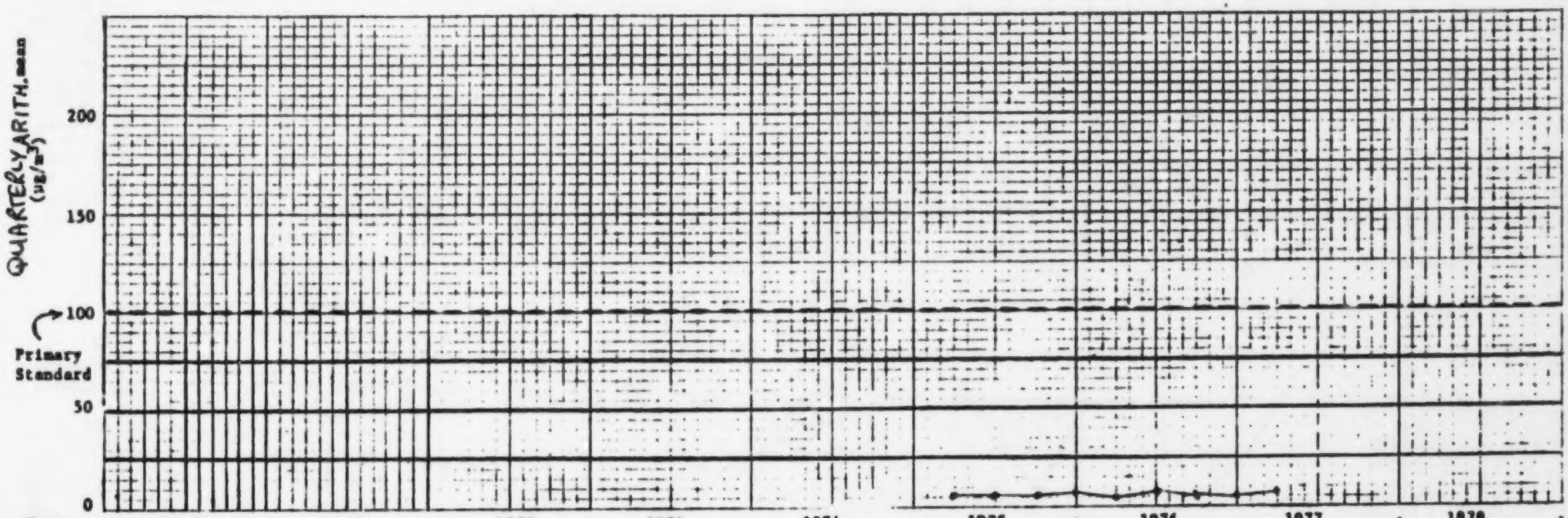
Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.						13	11	9	5	19	19	19	16																							
MAXIMUM 24 hr (μg/m³)						65	15	14	6	5	3	3	3																							
2ND MAX 24 hr (μg/m³)						17	13	13	3	5	3	3	3																							
MAXIMUM 3 hr (μg/m³)																																				
2ND MAX 3 hr (μg/m³)																																				
QTR. ARITH MEAN (μg/m³)						13	7	12	3	3	3	3	3																							
No. of Obs. > 365 μg/m³						-			-																											
No. of Obs. > 1300 μg/m³																																				

* Value derived from data which do not meet summarization criteria

Fig 2.6.9.3
NO_2
bubbler

Site Location: NEWCASTLE, WY.

Site Code: 520820001F03

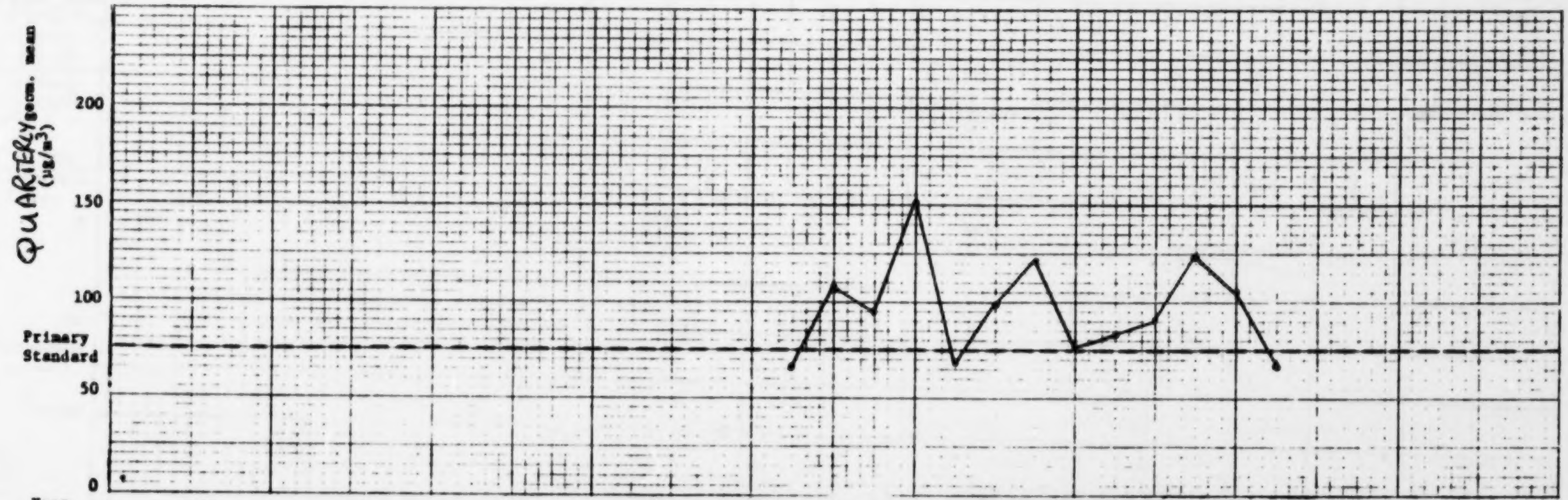


Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																					4	12	11	8	5	15	14	19	13							
Maximum (µg/m³)																					12	13	11	13	7	12	19	8	21							
2nd Max. (µg/m³)																					5	10	11	11	6	11	12	8	16							
ARITH. Quarterly ~~mean~~ (µg/m³)																					6*	6	6	7	4	7	6	5	7							
No. of Obs >200 µg/m³																					-	-	-	-	-	-	-	-								
No. of Obs >100 µg/m³																					-	-	-	-	-	-	-	-	-							
No. of Obs/yr.																								35				48								

* Value derived from data which do not meet summarization criteria.

Fig 2.6.5
TSP

Site Location: Rock Springs, Wy.
Site Code: 520620001F01



Year Quarter	1970 1	2	3	4	1971 1	2	3	4	1972 1	2	3	4	1973 1	2	3	4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
Quarterly geom. mean (µg/m³)																
No. of Obs >260 µg/m³																
No. of Obs >150 µg/m³																

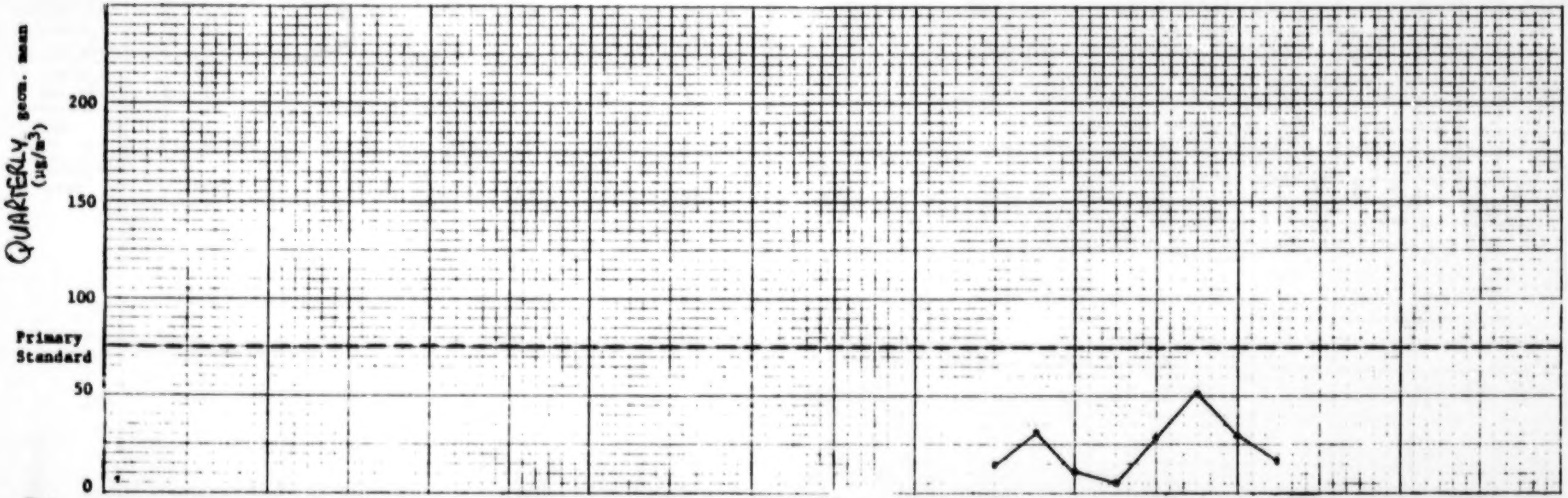
Year Quarter	1974 1	2	3	4	1975 1	2	3	4	1976 1	2	3	4	1977 1	2	3	4	1978 1	2	3	4
No. of Obs.	13	10	19	15	12	15	15	15	15	14	15	14	14							
Maximum (µg/m³)	205	295	300	347	231	207	205	172	155	248	218	187	220							
2nd Max. (µg/m³)	152	167	234	308	177	153	199	158	159	168	172	180	177							
Quarterly geom. mean (µg/m³)	67	118	39	151	68	99	122	77	73	91	124	106	67							
No. of Obs >260 µg/m³	-	1	1	5	-	-	-	-	-	-	-	-	-							
No. of Obs >150 µg/m³	2	3	4	9	2	2	5	2	3	2	3	3	3							
No. of Obs/yr.				52				57				58								

* Value derived from data which do not meet summarization criteria.

Fig. 2.6.6.
TSP

Green Ranch

Site Location: AFTON, NY.
Site Code: 520990002F01



Year	1970				1971				1972				1973			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																
Maximum (µg/m³)																
2nd Max. (µg/m³)																
Quarterly geom. mean (µg/m³)																
No. of Obs >260 µg/m³																
No. of Obs >150 µg/m³																

Year	1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.						15	11	12	16	15	13	14	15							
Maximum (µg/m³)						93	51	76	17	103	103	139	192							
2nd Max. (µg/m³)						36	50	32	16	93	93	66	45							
Quarterly geom. mean (µg/m³)						15	31	12	6	28	51	29	18							
No. of Obs >260 µg/m³						-	-		-	-	-	-	-							
No. of Obs >150 µg/m³						-	-	-	-	-	-	-	-							

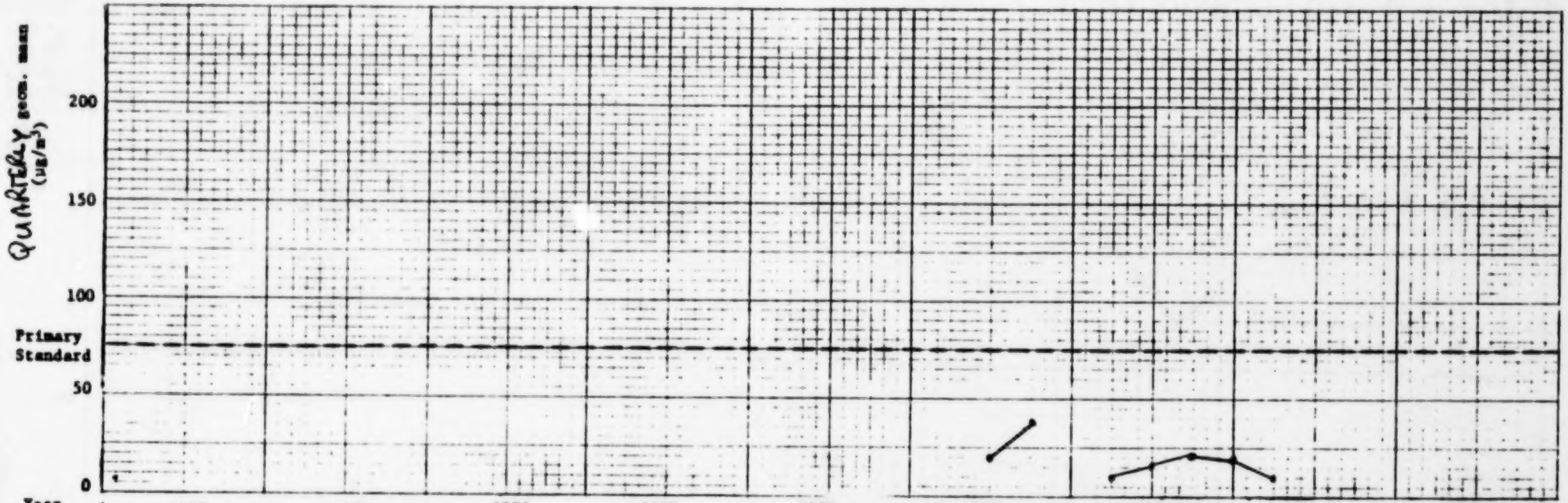
* Value derived from data which do not meet summarization criteria.

Fig 2.6.7

TSP

Site Location: IRENE RANCH, Wy.

Site Code: 520220002F01



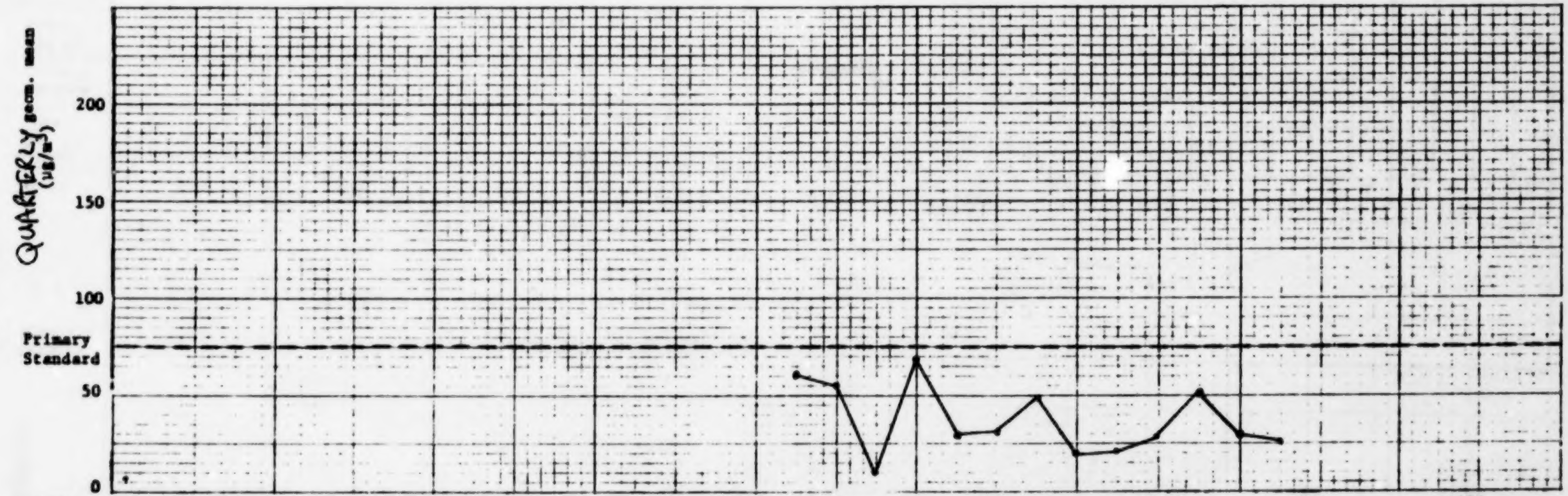
Year	1970				1971				1972				1973				1974			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				
Maximum (μg/m³)																				
2nd Max. (μg/m³)																				
Quarterly geom. mean (μg/m³)																				
No. of Obs >260 μg/m³																				
No. of Obs >150 μg/m³																				

Year	1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.		8	6	0	13	10	6	9	13							
Maximum (μg/m³)		49	55		20	41	43	105	47							
2nd Max. (μg/m³)		30	49		19	39	32	75	41							
Quarterly geom. mean (μg/m³)		21	38		10	17	21	19	10							
No. of Obs >260 μg/m³		-	-		-											
No. of Obs >150 μg/m³		-														

* Value derived from data which do not meet summarization criteria.

Fig 2.6.8
TSP

Site Location: BURKS RANCH, WY.
Site Code: 520180001F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																	15	13	13	11	12	15	15	15	14	19	19	15	14							
Maximum (µg/m3)																	98	79	63	231	79	56	75	59	39	86	125	208	98							
2nd Max. (µg/m3)																	87	70	59	159	69	45	73	48	31	58	118	139	92							
Quarterly geom. mean (µg/m3)																	61	55	11	68	30	31	49	20	21	29	51	30	26							
No. of Obs >260 µg/m3																	-			-	-	-	-			-	-	-								
No. of Obs >150 µg/m3																				2	-					-	-	1,								
No. of Obs/yr.																				50				57				57								

* Value derived from data which do not meet summarization criteria.

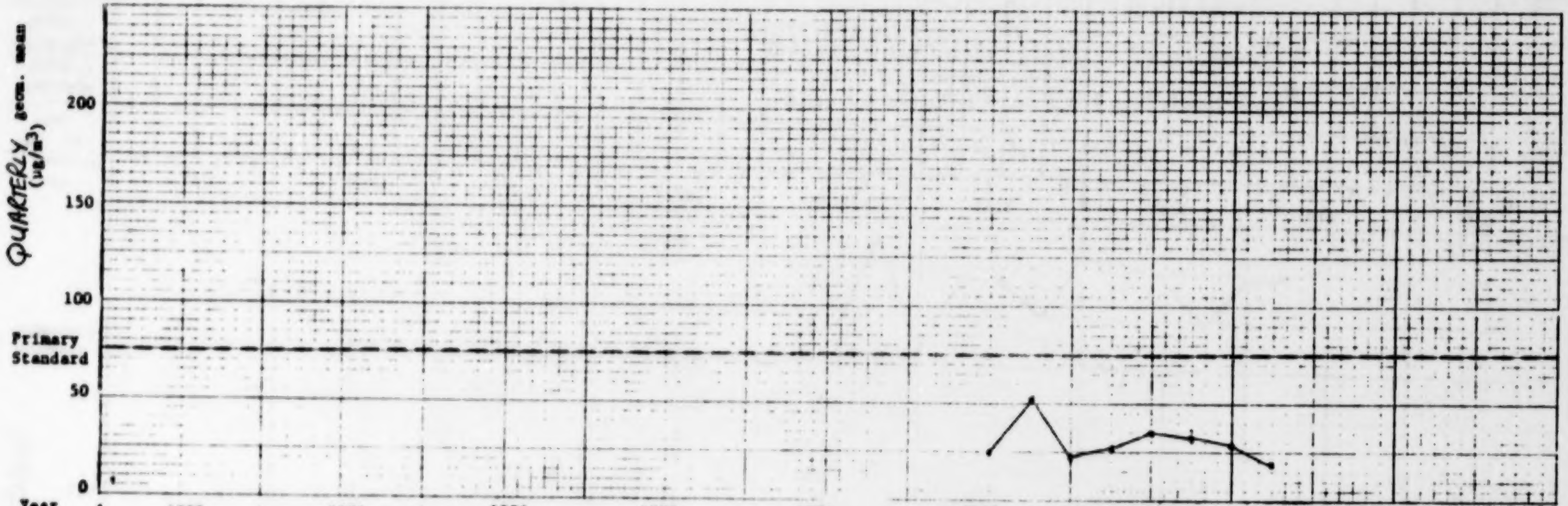
Fig 2.6.9
TSP

Site Location: [illegible]

Site Code: 52048[illegible]

[illegible]

811



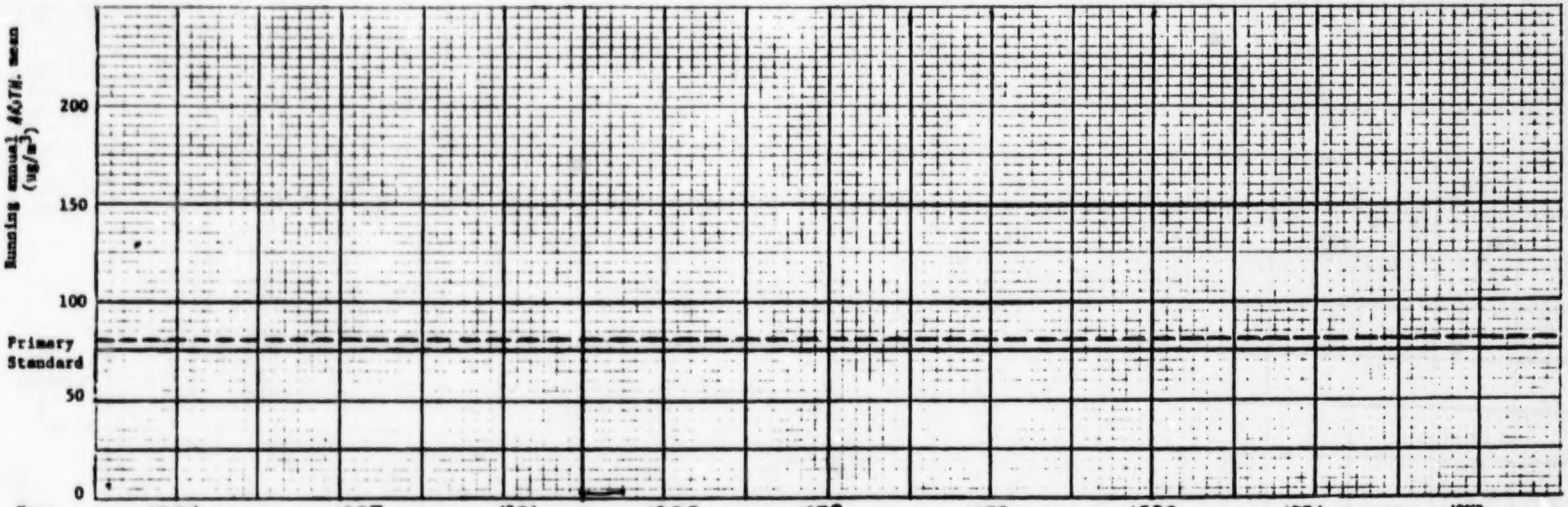
Year	1970				1971				1972				1973				1974			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																				
Maximum (µg/m³)																				
2nd Max. (µg/m³)																				
Quarterly geom. mean (µg/m³)																				
No. of Obs >260 µg/m³																				
No. of Obs >150 µg/m³																				

Year	1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.		15	15	15	15	12	15	11	15							
Maximum (µg/m³)		41	110	76	65	82	99	121	75							
2nd Max. (µg/m³)		27	79	[illegible]	63	58	50	70	67							
Quarterly geom. mean (µg/m³)		20	[illegible]	[illegible]	27	35	32	29	19							
No. of Obs >260 µg/m³						-	-	-	.							
No. of Obs >150 µg/m³						-	-	-	.							

* Value derived from data which do not meet summarization criteria.

Fig 2.6.10.1
SO_2
Bubbler

Site Location: Bill, Wyoming
Site Code: 520170004F03



Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.												11	15																							
MAXIMUM 24 hr ($\mu g/m^3$)												3	3																							
2ND MAX 24 hr ($\mu g/m^3$)												3	3																							
MAXIMUM 3 hr ($\mu g/m^3$)												-	.																							
2ND MAX 3 hr ($\mu g/m^3$)												-																								
QTR. ARITH MEAN ($\mu g/m^3$)												3	3																							
No. of Obs. >365 $\mu g/m^3$												-																								
No. of Obs. >1300 $\mu g/m^3$																																				

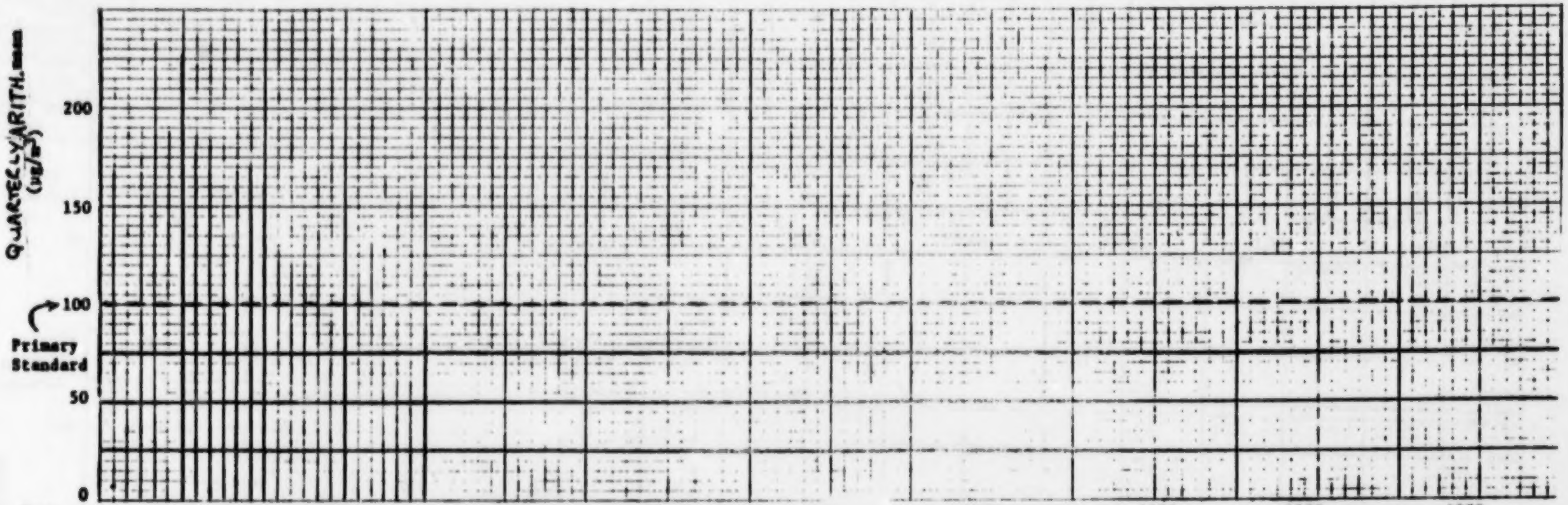
Fig 2.6.10.2

NO$_2$

BUBBLER

Site Location: [illegible]

Site Code: [illegible]



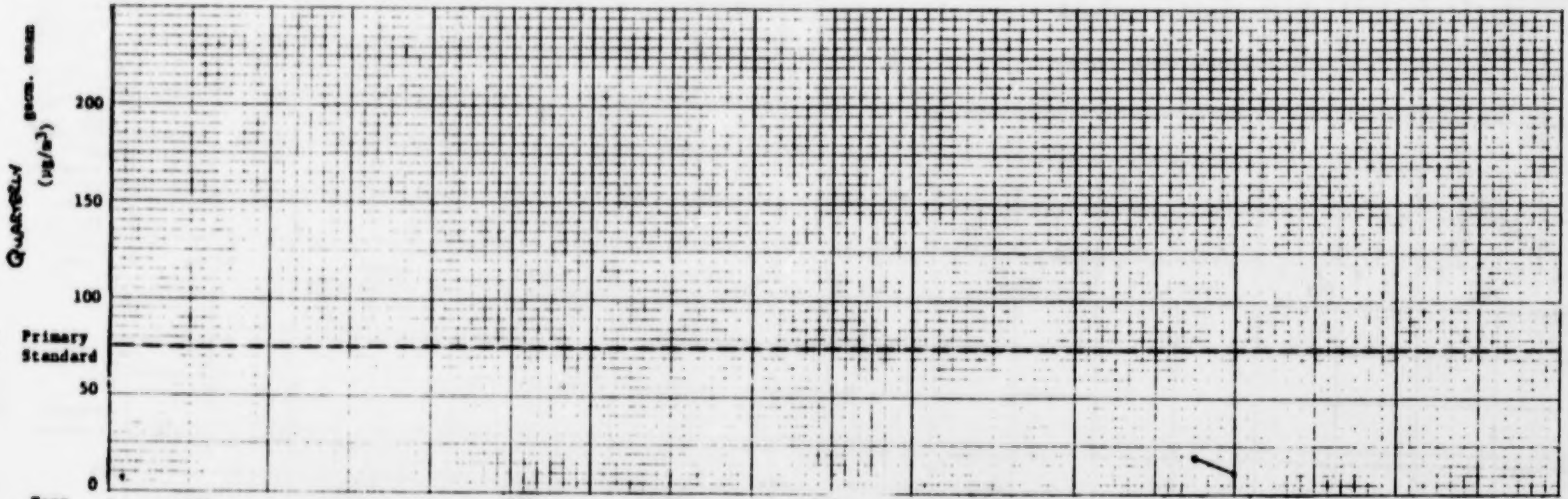
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																												8	14							
Maximum (µg/m³)																												6	11							
2nd Max. (µg/m³)																												3	9							
ARITH. Quarterly mean (µg/m³)																												3	5							
No. of Obs >200 µg/m³																												-	-							
No. of Obs >100 µg/m³																												-	-							

*Estimated Value

Fig 2.6.11.1
TSP

Site Location: KEMMERER, WY.

Site Code: 52 0990002F03



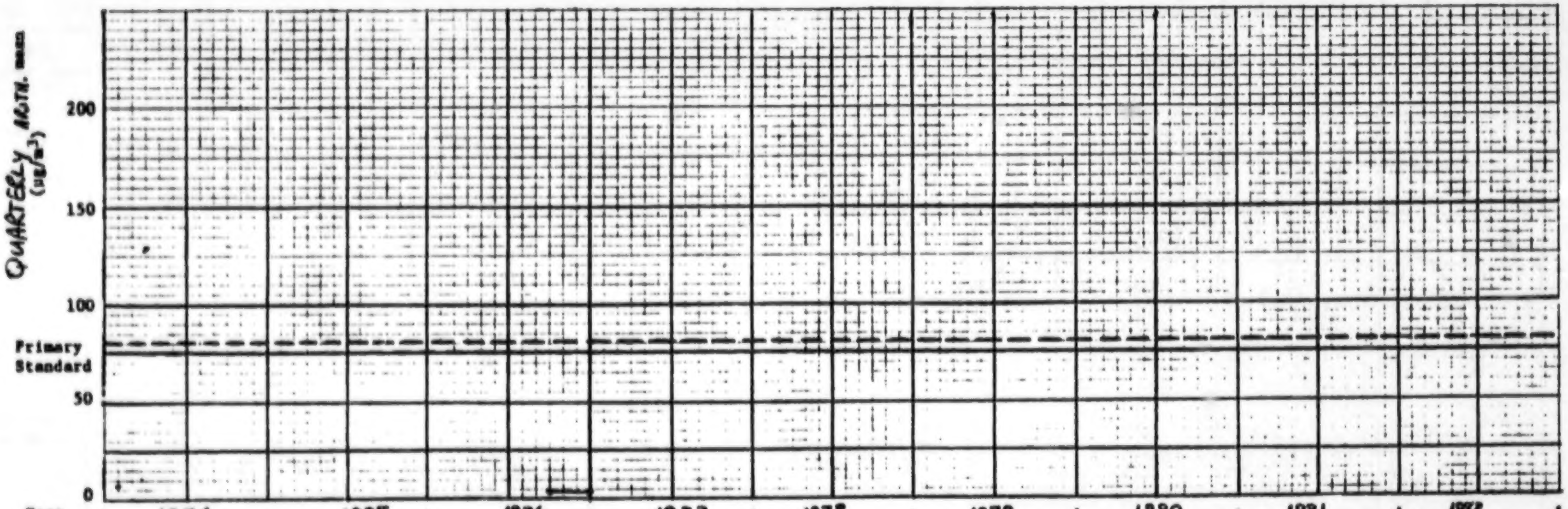
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																											5	10								
Maximum (µg/m³)																											45	26								
2nd Max. (µg/m³)																											30	24								
Quarterly geom. mean (µg/m³)																											18	11								
No. of Obs >260 µg/m³																																				
No. of Obs >150 µg/m³																																				

* Value derived from data which do not meet summarization criteria.

Fig 2.6.11.2
SO_2
bubbler

Site Location: KEMMERER, WY

Site Code: 520990003F03

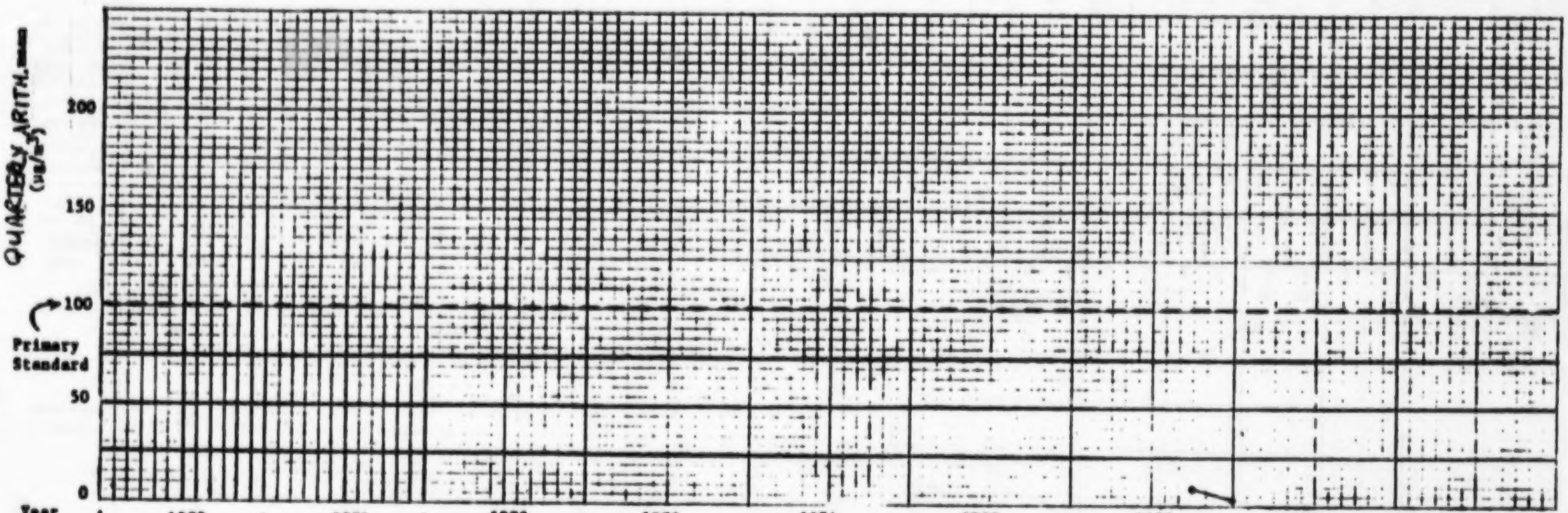


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.											7	3																								
MAXIMUM 24hr (µg/m³)											5	3																								
2ND MAX 24hr (µg/m³)											3	3																								
MAXIMUM 3 hr (µg/m³)																																				
2ND MAX 3hr (µg/m³)																																				
QTR. ARITH MEAN (µg/m³)											3	3*																								
No. of Obs. >365 µg/m³																																				
No. of Obs. >1300 µg/m³																																				

* Value derived from data which do not meet summarization criteria

Fig 2.6.11.3
NO$_2$
bubbler

Site Location: KEMMERER, Wy.
Site Code: 520490003F03



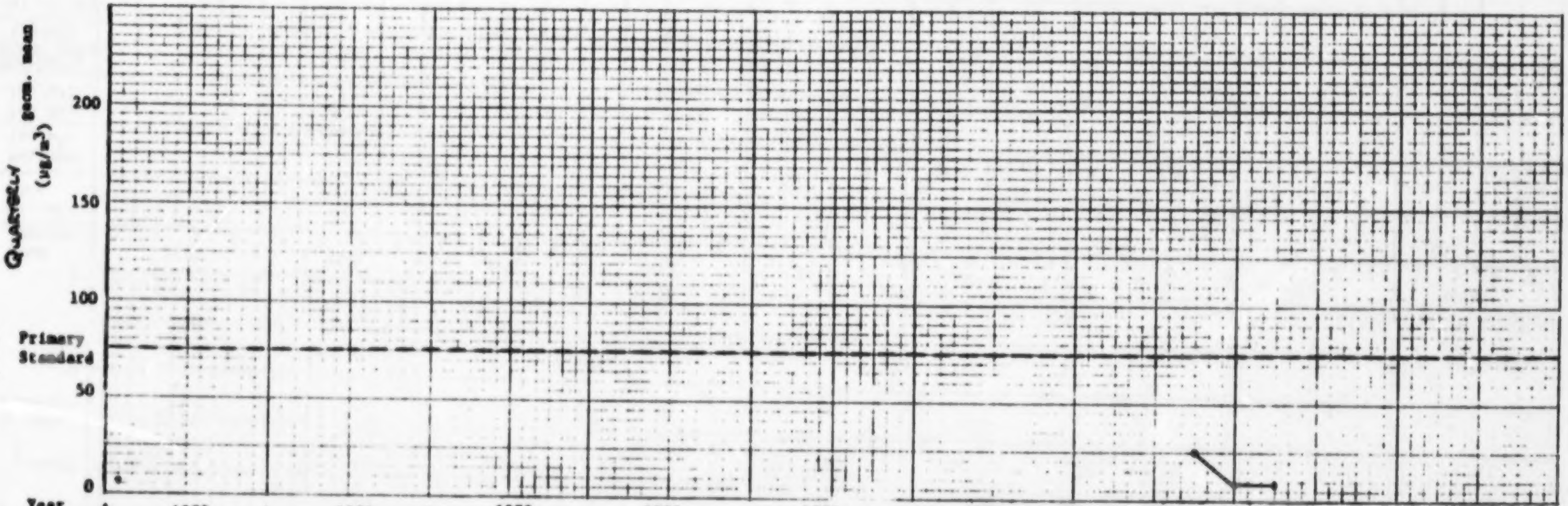
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																											7	2								
Maximum (µg/m³)																											14	3								
2nd Max. (µg/m³)																											12	3								
ARITH. Quarterly [redacted] Mean (µg/m³)																											9	3*								
No. of Obs >200 µg/m³																											-	-								
No. of Obs >100 µg/m³																																				

* Value derived from data which do not meet summarization criteria.

Fig. 2.6.12.1
TSP

Site Location: WHEATLAND, WY

Site Code: 520590001F03



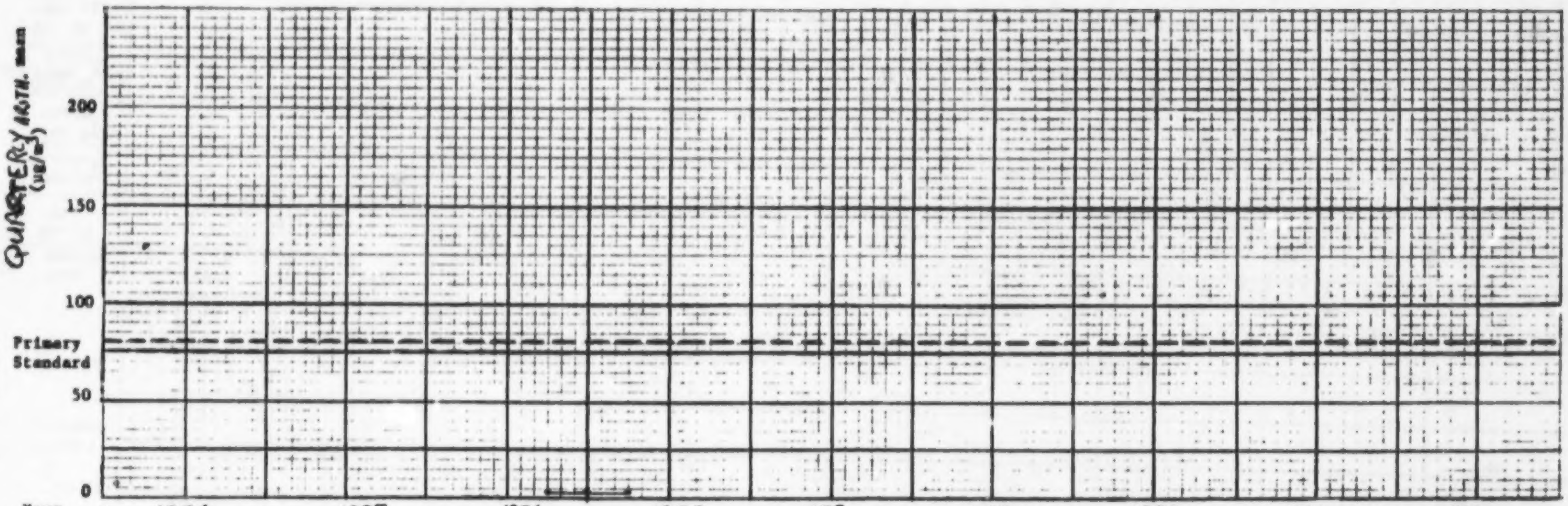
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																											13	15	14							
Maximum (µg/m³)																											255	33	22							
2nd Max. (µg/m³)																											43	30	20							
Quarterly geom. mean (µg/m³)																											25	8	8							
No. of Obs >260 µg/m³																											.	-	-							
No. of Obs >150 µg/m³																											1	.	.							

* Value derived from data which do not meet summarization criteria.

Fig 2.6.12.2
SO_2
bubbler

Site Location: WHEATLAND, WY.

Site Code: 520590001F03

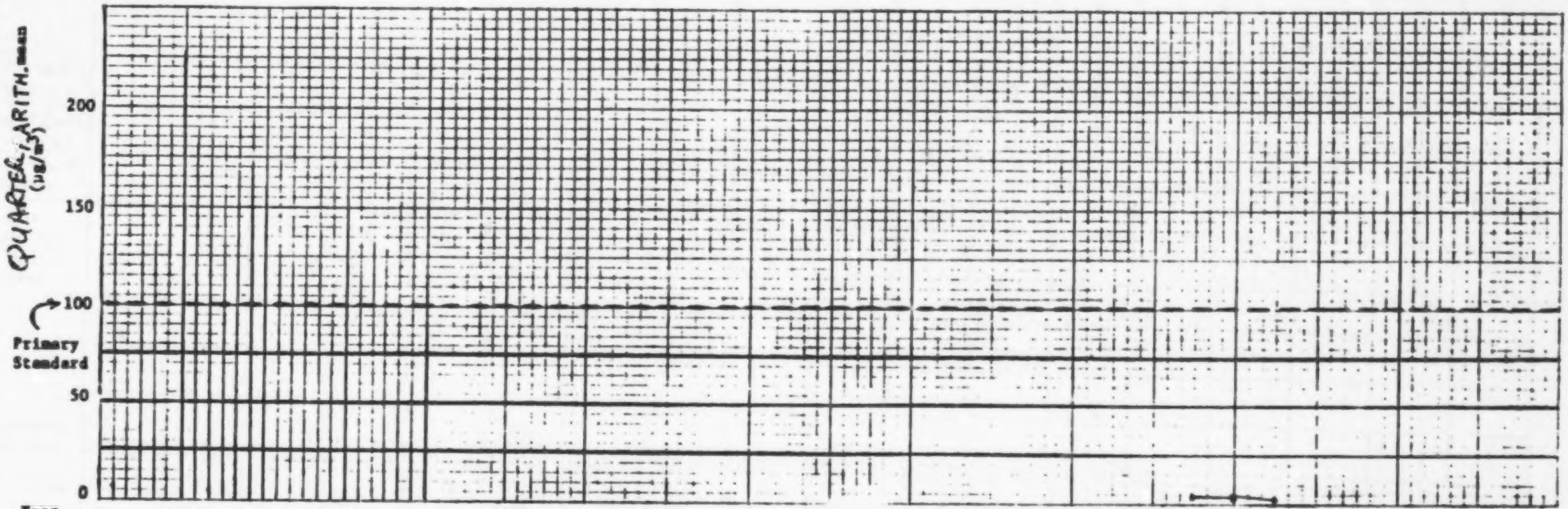


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.											13	9	14																							
MAXIMUM 24 hr (µg/m³)											3	3	3																							
2ND MAX 24 hr (µg/m³)											3	3	3																							
MAXIMUM 3 hr (µg/m³)																																				
2ND MAX 3 hr (µg/m³)																																				
QTR. ARITH MEAN (µg/m³)											3	3	3																							
No. of Obs. >365 µg/m³																																				
No. of Obs. >1300 µg/m³																																				

Fig 2.6.12.3
NO_2
bubbler

Site Location: WHEATLAND, WY.

Site Code: 520540001F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																											14	11	14							
Maximum (μg/m³)																											10	13	6							
2nd Max. (μg/m³)																											8	6	3							
Quarterly ARITH. mean (μg/m³)																											4	4	3							
No. of Obs >200 μg/m³																											-	-	-							
No. of Obs >100 μg/m³																											-	-	-							

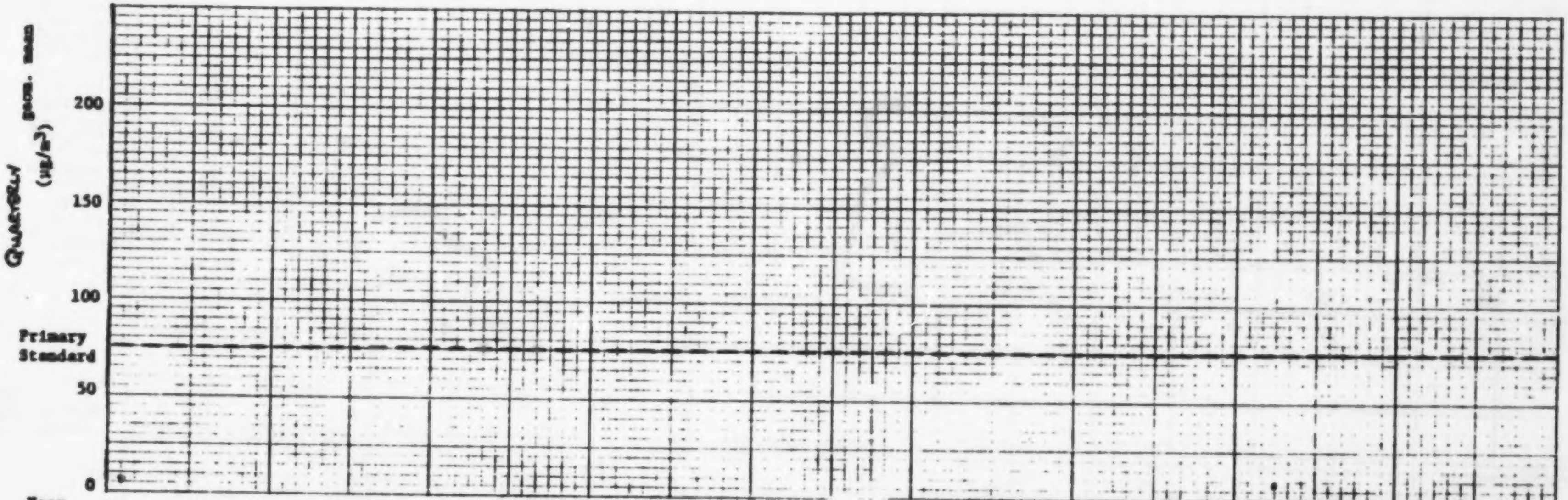
* Value derived from data which do not meet summarization criteria.

Fig 2.6.13.1

TSP

Site Location: Douglas, Wyoming

Site Code: 520180006F03



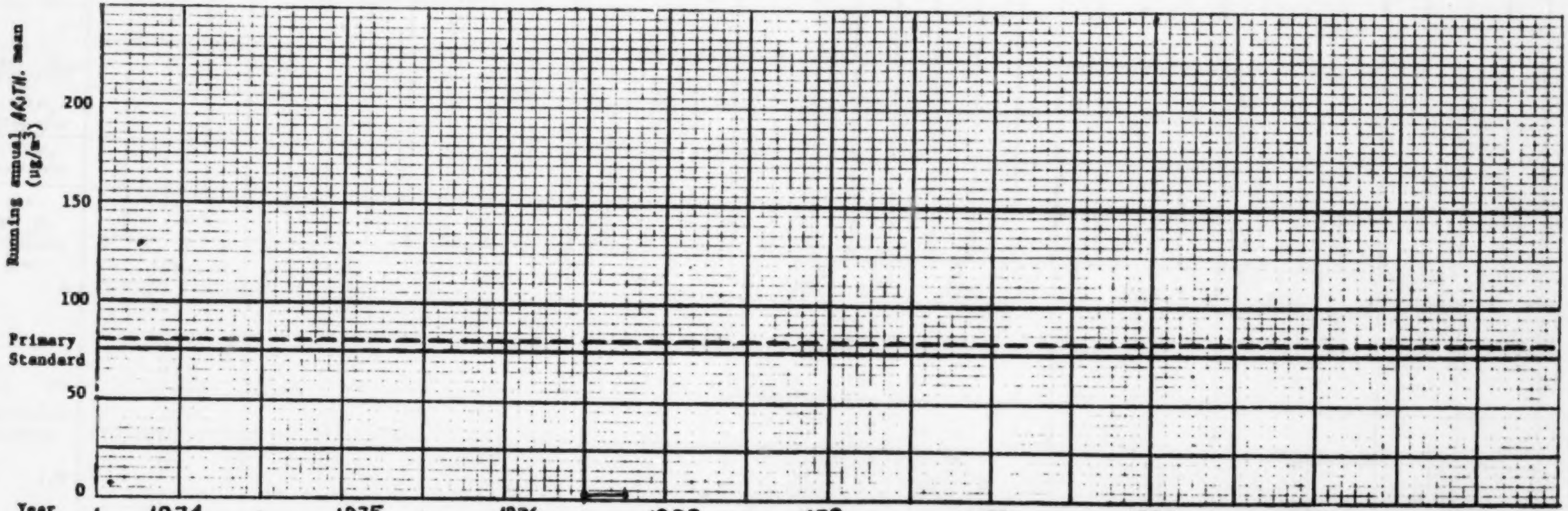
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																													13							
Maximum (µg/m³)																													43							
2nd Max. (µg/m³)																													19							
Quarterly geom. mean (µg/m³)																													8							
No. of Obs >260 µg/m³																													-							
No. of Obs >150 µg/m³																													-							

*Estimated Value

Fig 2.6. 13.2
SO_2
CONTINOUS

Site Location: Douglas, Wyoming

Site Code: 520180006F03

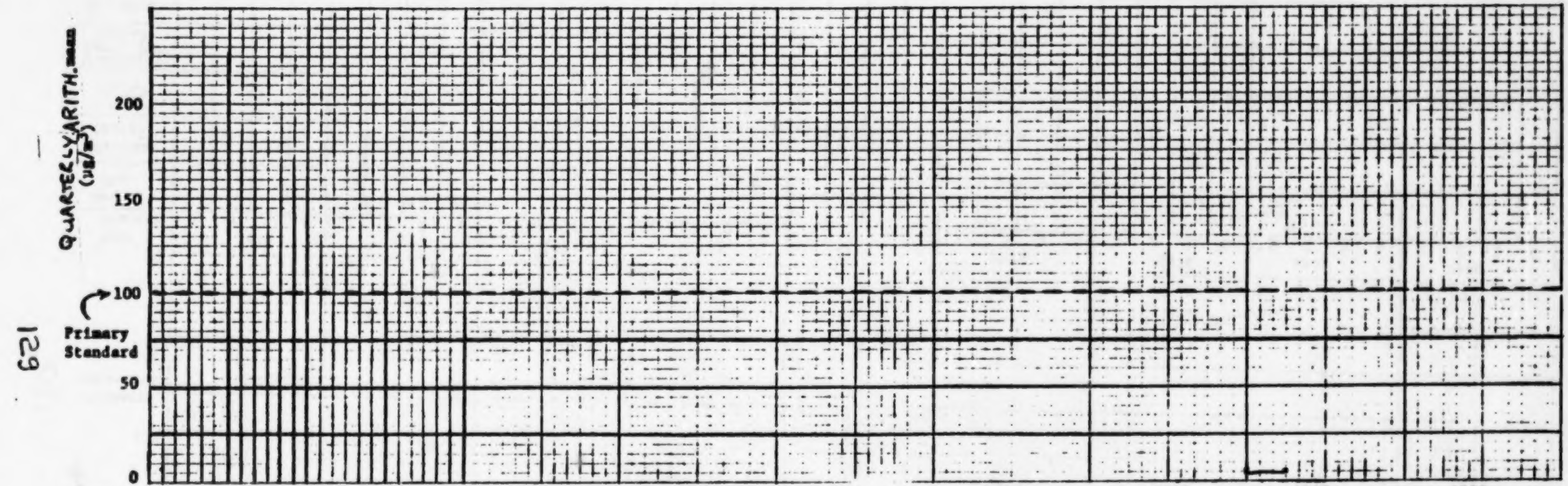


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.												1662	2043																							
MAXIMUM 24 hr (Mg/m^3)												6	6																							
2ND MAX 24 hr (Mg/m^3)												5	5																							
MAXIMUM 3 hr (Mg/m^3)												28	27																							
2ND MAX 3 hr (Mg/m^3)												19	99																							
QTR. ARITH MEAN (Mg/m^3)												3	3																							
No. of Obs. > 365 Mg/m^3												-	-																							
No. of Obs. > 1300 Mg/m^3												-	-																							

Fig 2.6.13.3
NO₂
CONTINOUS

Site Location Douglas, Wyoming

Site Code: 520180006F03



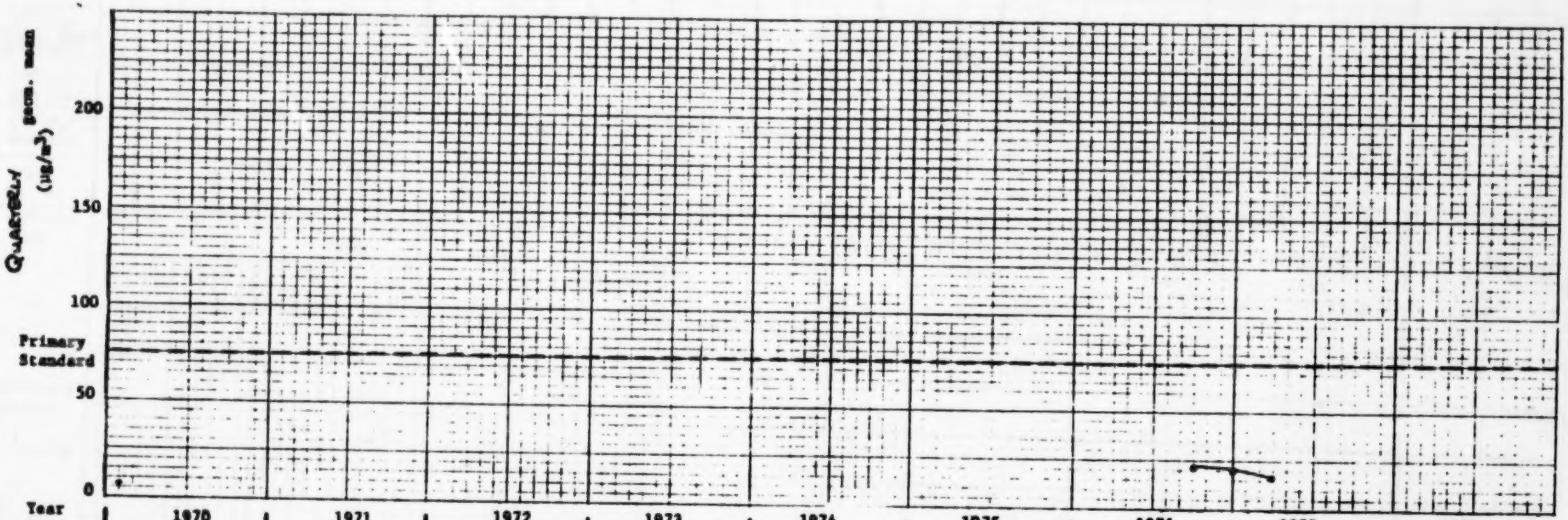
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																												1178	2087							
Maximum (μg/m³)																												38	5							
2nd Max. (μg/m³)																												19	5							
ARITH. Quarterly mean (μg/m³)																												5	5							
No. of Obs >200 μg/m³																												-	-							
No. of Obs >100 μg/m³																												-	-							

*Estimated Value

Fig 2.6.14.1
TSP

Site Location: PATRICK DRAW, Wyoming

Site Code: 520700016F03



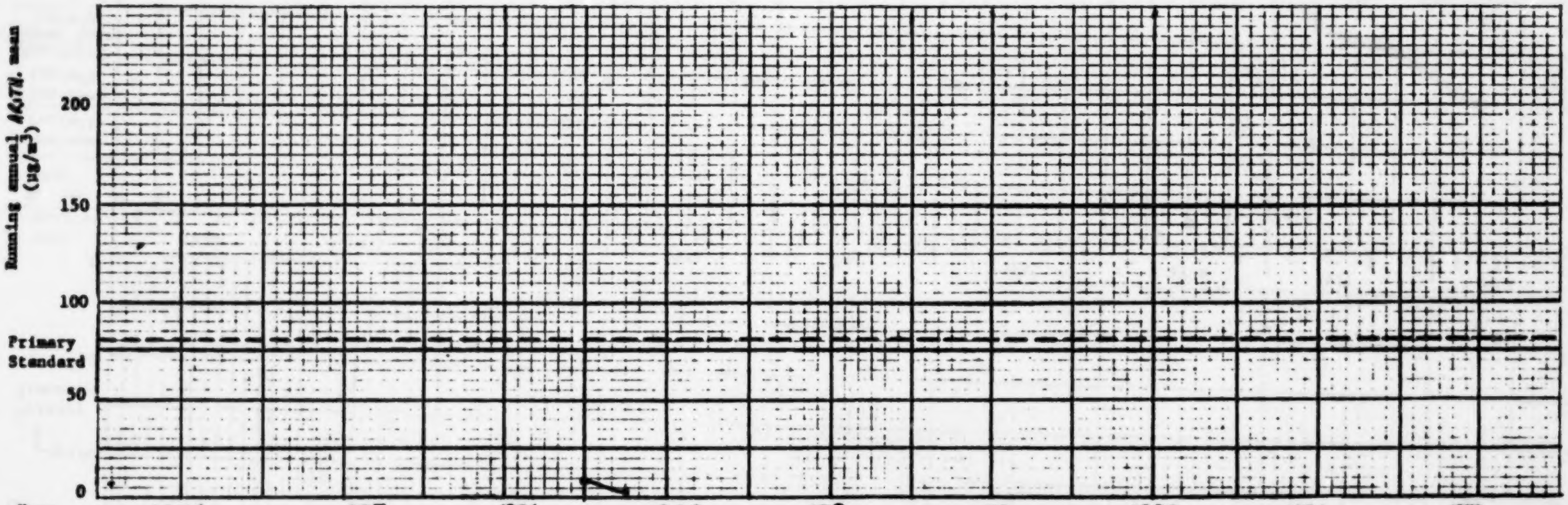
Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																											13	12	14							
Maximum (µg/m³)																											38	53	44							
2nd Max. (µg/m³)																											32	41	29							
Quarterly geom. mean (µg/m³)																											23	20	17							
No. of Obs >260 µg/m³																											-	-	-							
No. of Obs >150 µg/m³																																				

*Estimated Value

Fig 2.6.14.2
SO₂
CONTINOUS

Site Location: PATRICK DRAW, WYOMING

Site Code: 520700016F03

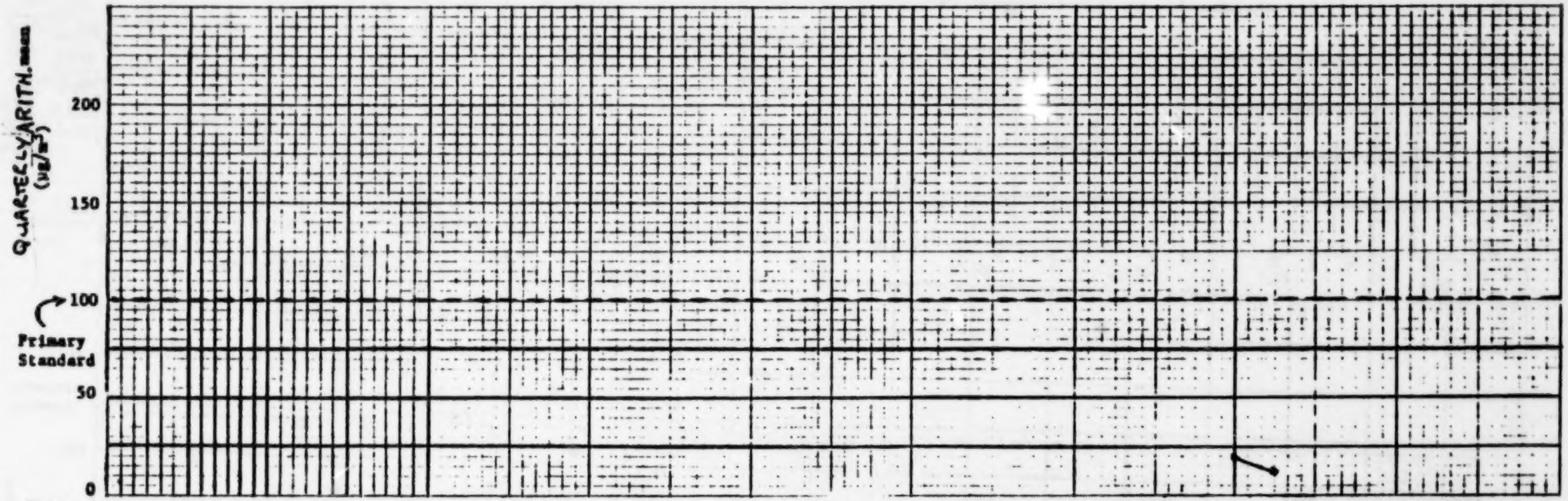


Year	1974				1975				1976				1977				1978				1979				1980				1981				1982			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.												1144	2101																							
MAXIMUM 24 hr (Mg/m³)												37	18																							
2ND MAX 24 hr (Mg/m³)												36	17																							
MAXIMUM 3 hr (Mg/m³)												296	123																							
2ND MAX 3 hr (Mg/m³)												210	115																							
QTR. ARITH MEAN (Mg/m³)												8*	3																							
No. of Obs. >365 Mg/m³																																				
No. of Obs. >1300 Mg/m³																																				

Fig 2.6, 14.3
NO₂
CONTINOUS

Site Location: PATRICK DRAW, WYOMING

Site Code: 520700016F03



Year	1970				1971				1972				1973				1974				1975				1976				1977				1978			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
No. of Obs.																												1230	2081							
Maximum (µg/m³)																												307	150							
2nd Max. (µg/m³)																												292	132							
ARITH. Quarterly mean (µg/m³)																												29*	13							
No. of Obs >200 µg/m³																												-								
No. of Obs >100 µg/m³																																				

*Estimated Value

SECTION 3.0

SECTION 3.0

In 1974 PEDCo Environmental, under an EPA contract, established twenty-two monitoring sites in Montana, North Dakota, South Dakota and Wyoming. These monitoring sites were established as part of the Northern Great Plains Resource Program (NGPRP) plan to monitor development in Energy Resource areas. From September 1974 to August 1975 the monitors were operated by the contractor and then the operation was turned over to the various state air pollution control agencies.

In Figures 3.1 thru 3.6 a summary of the data collected by the contractor from September 1974 to August 1976 is compared to a summary of data collected by the state agencies during a similar time period the following year, third quarter 1975 thru the second quarter of 1976. To expedite this report annual averages were calculated by averaging the quarterly averages. This method compares very well with the proper method of taking an annual mean of the raw data. Comparisons of data collected from these sites for calendar years 1975 and 1976 utilize the proper method. Figures 3.7 thru 3.12 show these comparisons.

In summarizing the data collected by the contractor and the data collected by the state and comparing the results for similar time periods as well as two separate calendar years two interesting conclusions are revealed. These conclusions are (1) Annual average concentration of TSP values were high from 3rd quarter '75 to 2nd quarter '76 than during the similar period in 1974-1975., (2) Short term SO_2 and NO_x values were hgiher in '75 - '76 than during '74 - '75.

Not enough data, as yet, has been collected to determine long term trends with any degree of accuracy. At several sites a significant amount of data was missing or insufficient so that averages could not be determined. These sites continue to be operated by the state agencies at this time.

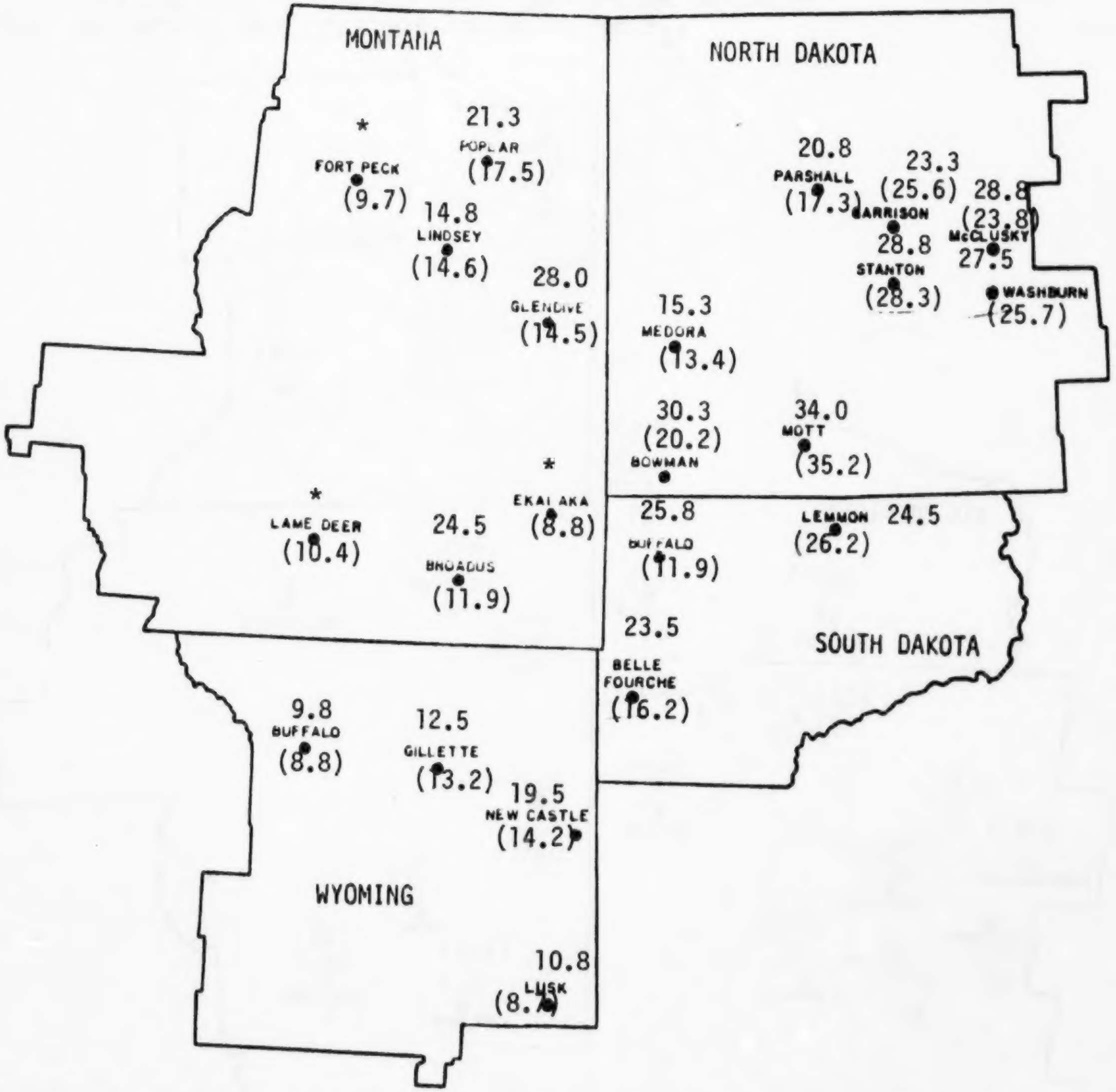

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
*
FORT PECK
(9.7)
21.3
POPLAR
(17.5)
14.8
LINDSEY
(14.6)
28.0
GLENDIVE
(14.5)
*
LAME DEER
(10.4)
24.5
BROADUS
(11.9)
*
EKALAKA
(8.8)
20.8
PARSHALL
(17.3)
23.3
(25.6)
GARRISON
28.8
STANTON
(28.3)
28.8
(23.8)
McCLUSKY
27.5
WASHBURN
(25.7)
15.3
MEDORA
(13.4)
30.3
(20.2)
BOWMAN
34.0
MOTT
(35.2)
25.8
BUFFALO
(11.9)
LEMMON
(26.2)
24.5
23.5
BELLE FOURCHE
(16.2)
9.8
BUFFALO
(8.8)
12.5
GILLETTE
(13.2)
19.5
NEW CASTLE
(14.2)
10.8
LUSK
(8.7)

Fig. 3.1 Annual TSP Values (μg/m3) - Geometric Mean 3rd Qtr. 1975 to 2nd Qtr. 1976
Values in ( ) were calculated by PEDCo - Sept. '74 to Aug. '75.
* Where only one number appears there was insufficient data to calculate annual mean.

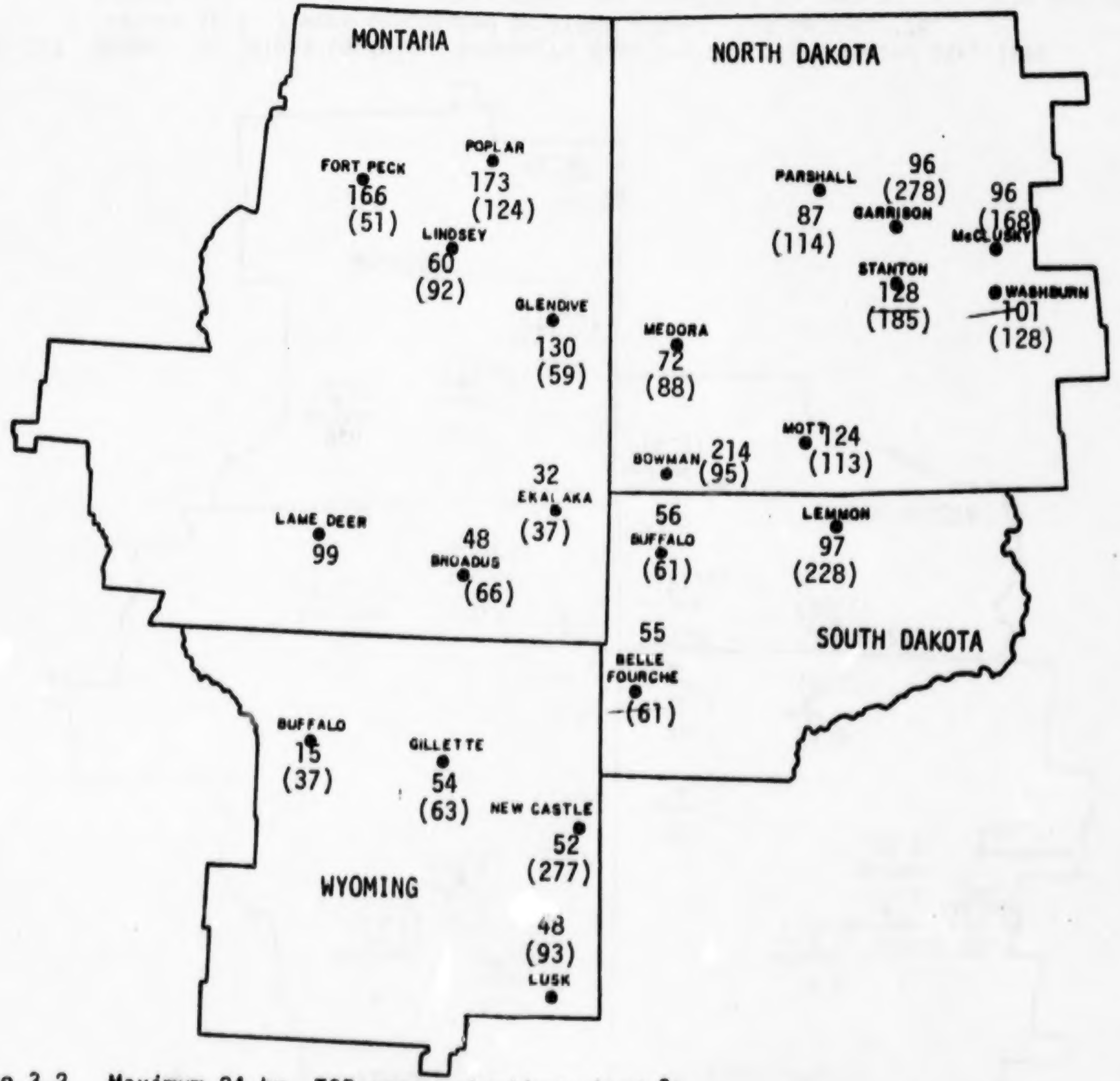

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
FORT PECK
166
(51)
POPLAR
173
(124)
LINDSEY
60
(92)
GLENDIVE
130
(59)
32
EKALAKA
(37)
LAME DEER
99
48
BROADUS
(66)
PARSHALL
87
(114)
96
(278)
GARRISON
96
(168)
McCLUSKY
STANTON
128
(185)
WASHBURN
101
(128)
MEDORA
72
(88)
BOWMAN
214
(95)
MOTT
124
(113)
56
BUFFALO
(61)
LEMMON
97
(228)
55
BELLE FOURCHE
(61)
BUFFALO
15
(37)
GILLETTE
54
(63)
NEW CASTLE
52
(277)
48
(93)
LUSK

Figure 3.2 Maximum 24 hr. TSP concerntrations (ug/m^3)
3rd QTR 1975 to 2nd QTR 1976 - May not be inclusive
Numbers in ( ) indicate values measured by PEDCo (Sept. 1974 to Aug. 1975).

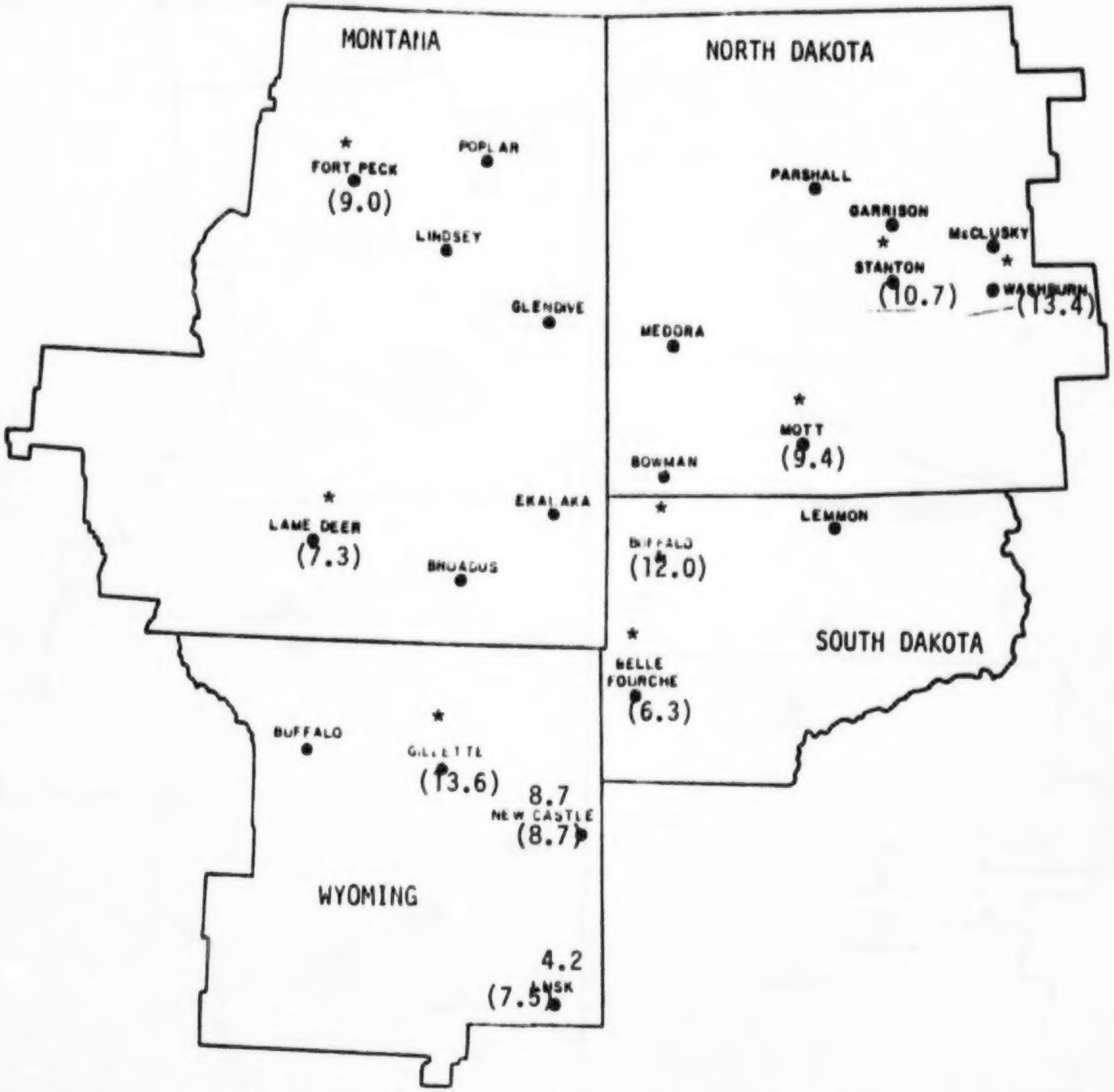

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
FORT PECK
(9.0)
POPLAR
LINDSEY
GLENDIVE
LAME DEER
(7.3)
EKALAKA
BROADUS
PARSHALL
GARRISON
McCLUSKY
STANTON
(10.7)
WASHBURN
(13.4)
MEDORA
MOTT
(9.4)
BOWMAN
LEMMON
BUFFALO
(12.0)
BELLE FOURCHE
(6.3)
BUFFALO
GILLETTE
(13.6)
8.7
NEW CASTLE
(8.7)
4.2
LUSK
(7.5)
*

Figure 3.3 Annual Arithmetic Mean Concentrations of SO_2 (ug/m^3)
Values in ( ) were calculated by PEDCo - Sept. '74 to Aug. '75

* Insufficient data to calculate mean.

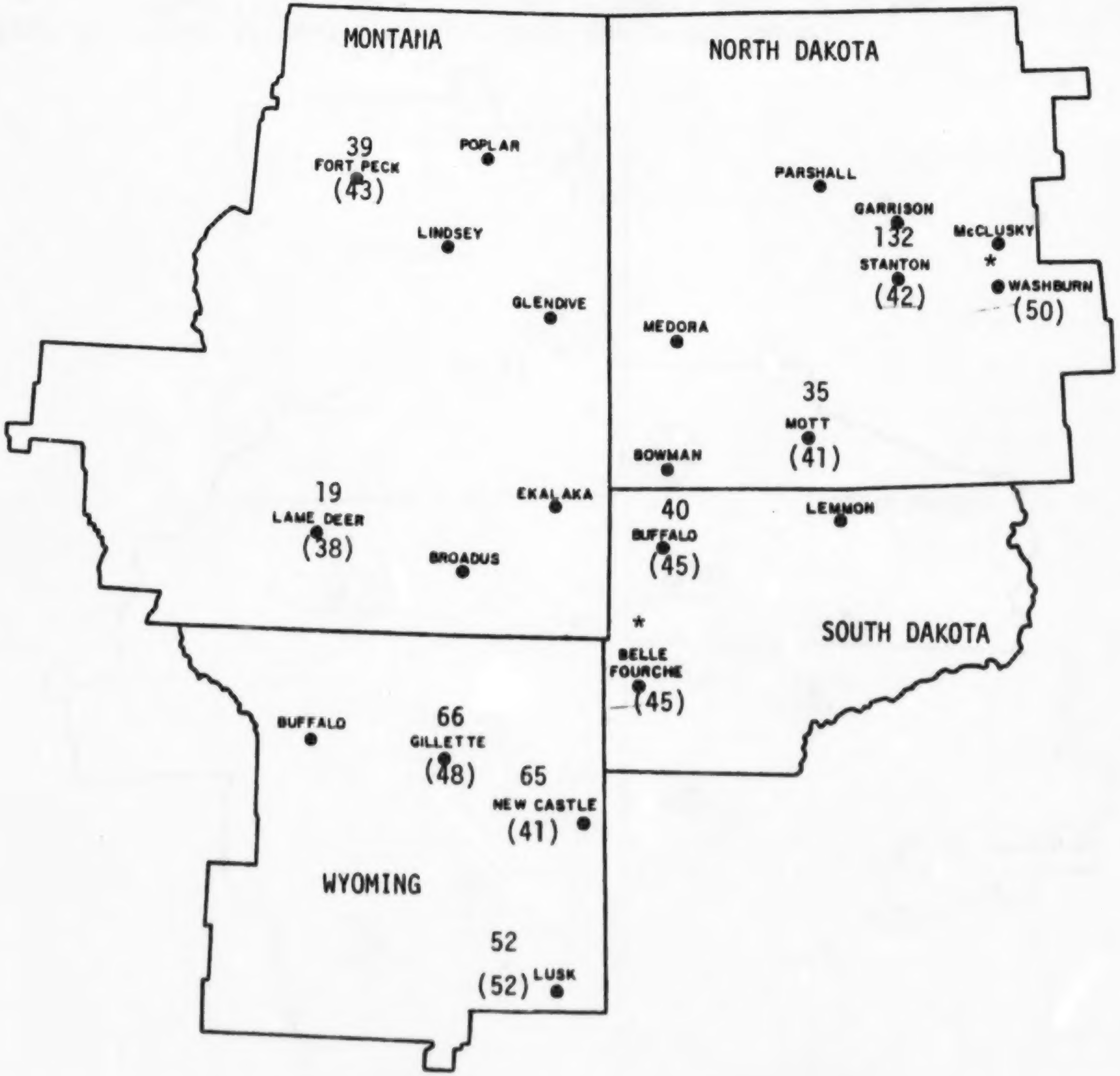

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
39
FORT PECK
(43)
POPLAR
LINDSEY
GLENDIVE
19
LAME DEER
(38)
EKALAKA
BROADUS
PARSHALL
GARRISON
132
STANTON
(42)
McCLUSKY
*
WASHBURN
(50)
MEDORA
35
MOTT
(41)
BOWMAN
40
BUFFALO
(45)
LEMMON
*
BELLE FOURCHE
(45)
BUFFALO
66
GILLETTE
(48)
65
NEW CASTLE
(41)
52
(52)
LUSK

Figure 3.4 24 hour maximum SO$_2$ Values (ug/m^3)
Values in ( ) were claculated by PEDCO - September '74 to August '75.

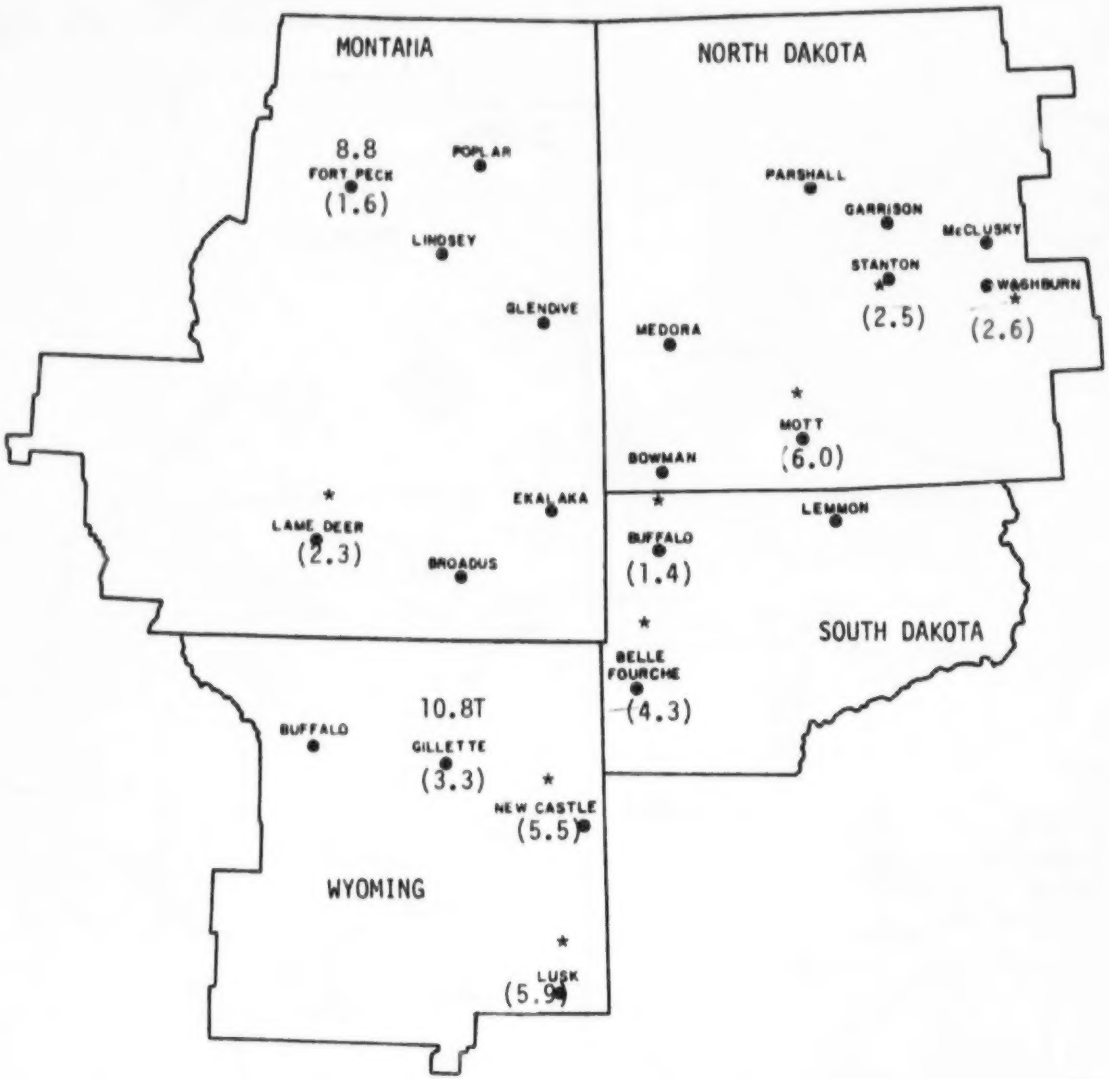

MONTANA
NORTH DAKOTA
8.8
FORT PECK
(1.6)
POPLAR
LINDSEY
GLENDIVE
*
LAME DEER
(2.3)
EKALAKA
BROADUS
PARSHALL
GARRISON
McCLUSKY
STANTON
(2.5)
WASHBURN
*
(2.6)
MEDORA
*
MOTT
(6.0)
BOWMAN
*
BUFFALO
(1.4)
LEMMON
SOUTH DAKOTA
*
BELLE FOURCHE
(4.3)
10.8T
BUFFALO
GILLETTE
(3.3)
*
NEW CASTLE
(5.5)
WYOMING
*
LUSK
(5.9)

Figure 3.5 NO_2, Annual Arithmetic Mean in ug/m^3
PEDCo Values for September '74 to August '75 in ( )

* Not able to calculate - insufficeint date.
+ From continuous data

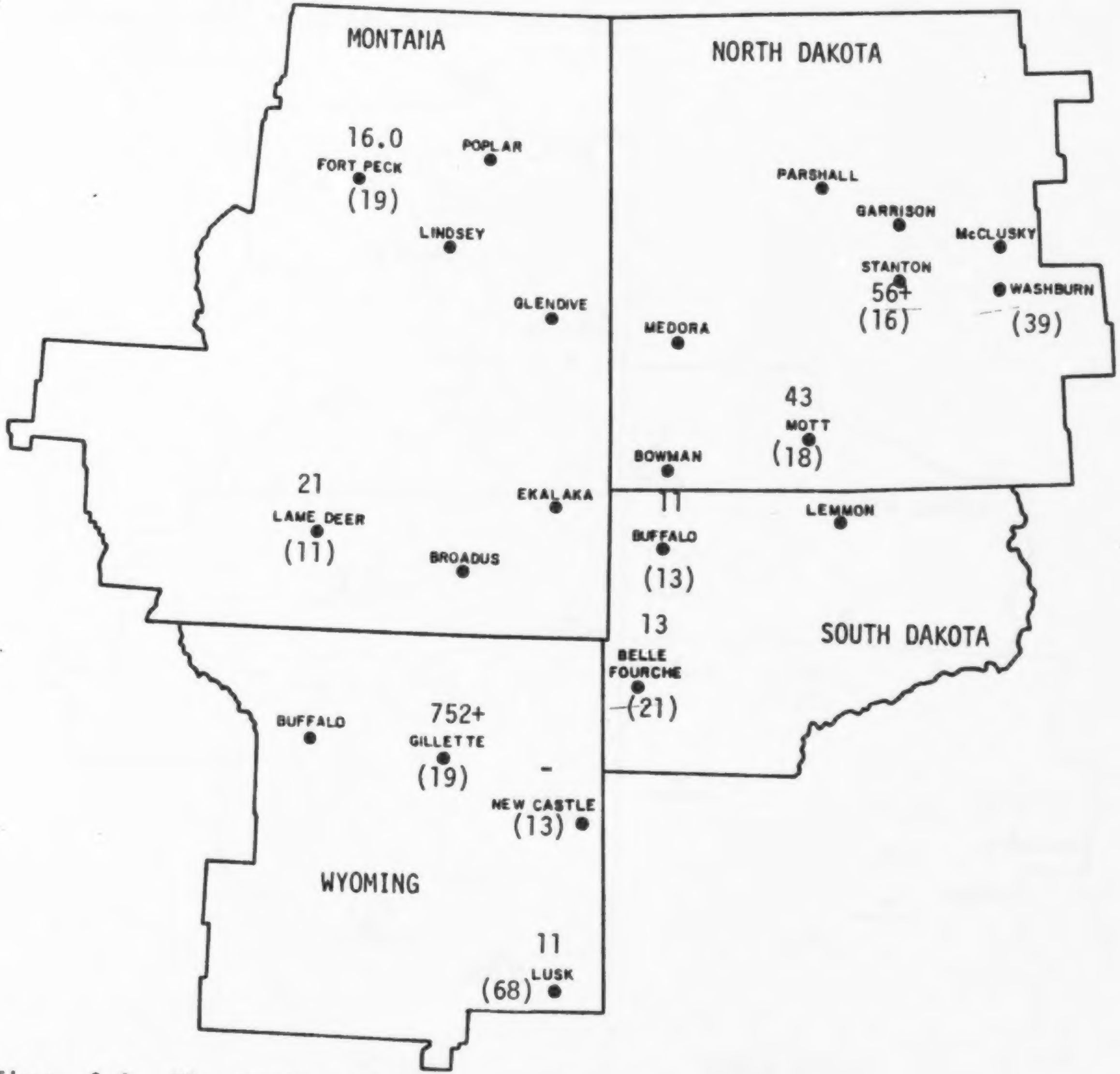

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
16.0
FORT PECK
(19)
POPLAR
LINDSEY
GLENDIVE
21
LAME DEER
(11)
EKALAKA
BROADUS
PARSHALL
GARRISON
McCLUSKY
STANTON
56+
(16)
WASHBURN
(39)
MEDORA
43
MOTT
(18)
BOWMAN
11
BUFFALO
(13)
LEMMON
13
BELLE FOURCHE
(21)
BUFFALO
752+
GILLETTE
(19)
-
NEW CASTLE
(13)
11
LUSK
(68)

Figure 3.6 NO_2, Maximum 24-hour concentration in ug/m3
PEDCo Values in ( )

- No new data
+ from continuous data.

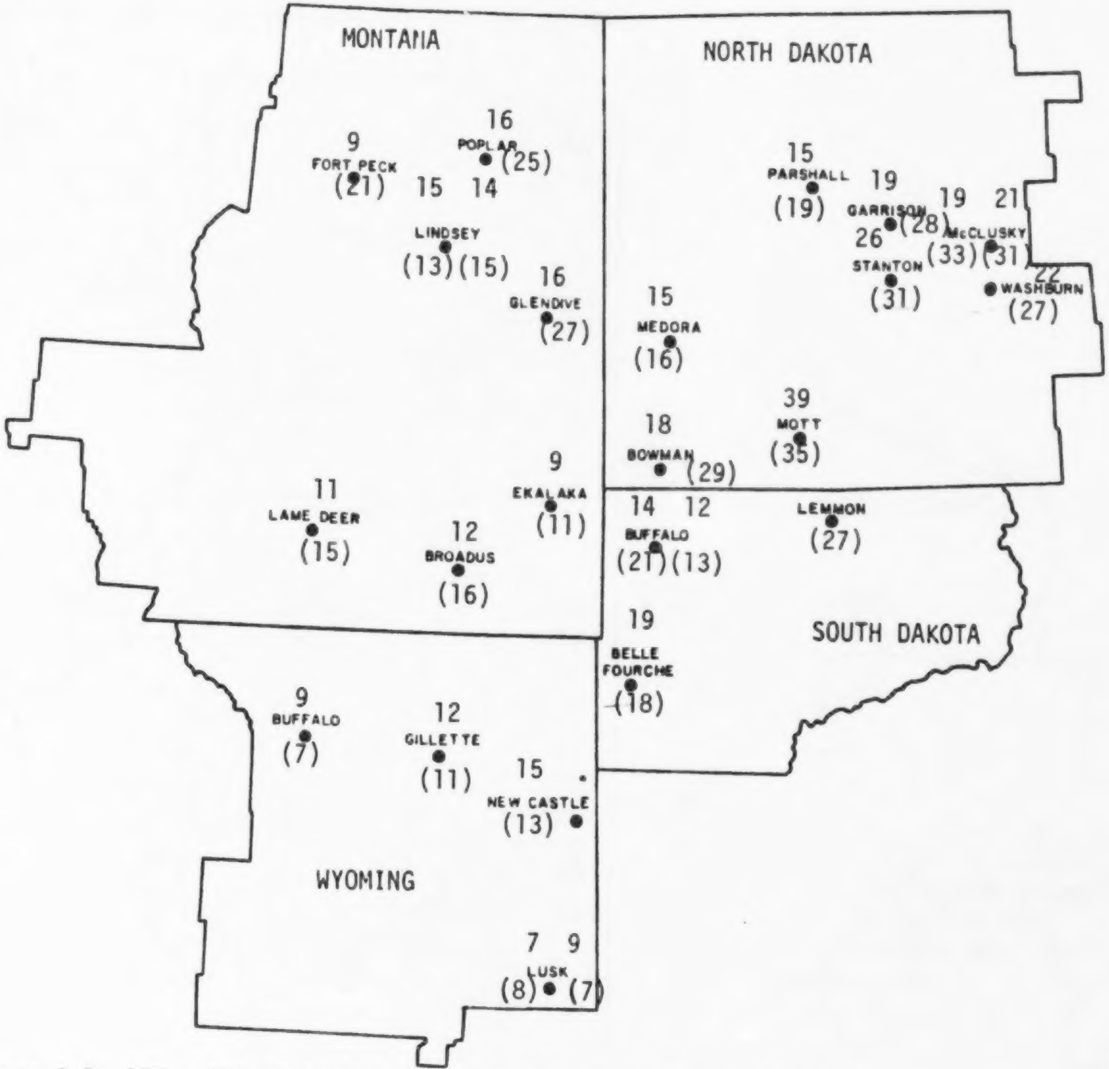

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
9
FORT PECK
(21)
16
POPLAR
(25)
15
14
LINDSEY
(13)
(15)
16
GLENDIVE
(27)
11
LAME DEER
(15)
12
BROADUS
(16)
9
EKALAKA
(11)
15
PARSHALL
(19)
19
GARRISON
(28)
26
STANTON
(31)
19
McCLUSKY
(33)
21
(31)
22
WASHBURN
(27)
15
MEDORA
(16)
18
BOWMAN
(29)
39
MOTT
(35)
14
12
BUFFALO
(21)
(13)
LEMMON
(27)
19
BELLE FOURCHE
(18)
9
BUFFALO
(7)
12
GILLETTE
(11)
15
NEW CASTLE
(13)
7
9
LUSK
(8)
(7)

Figure 3.7 '75 - '76 Calendar Year Annual Ceometric Mean TSP Values
'76 ( )

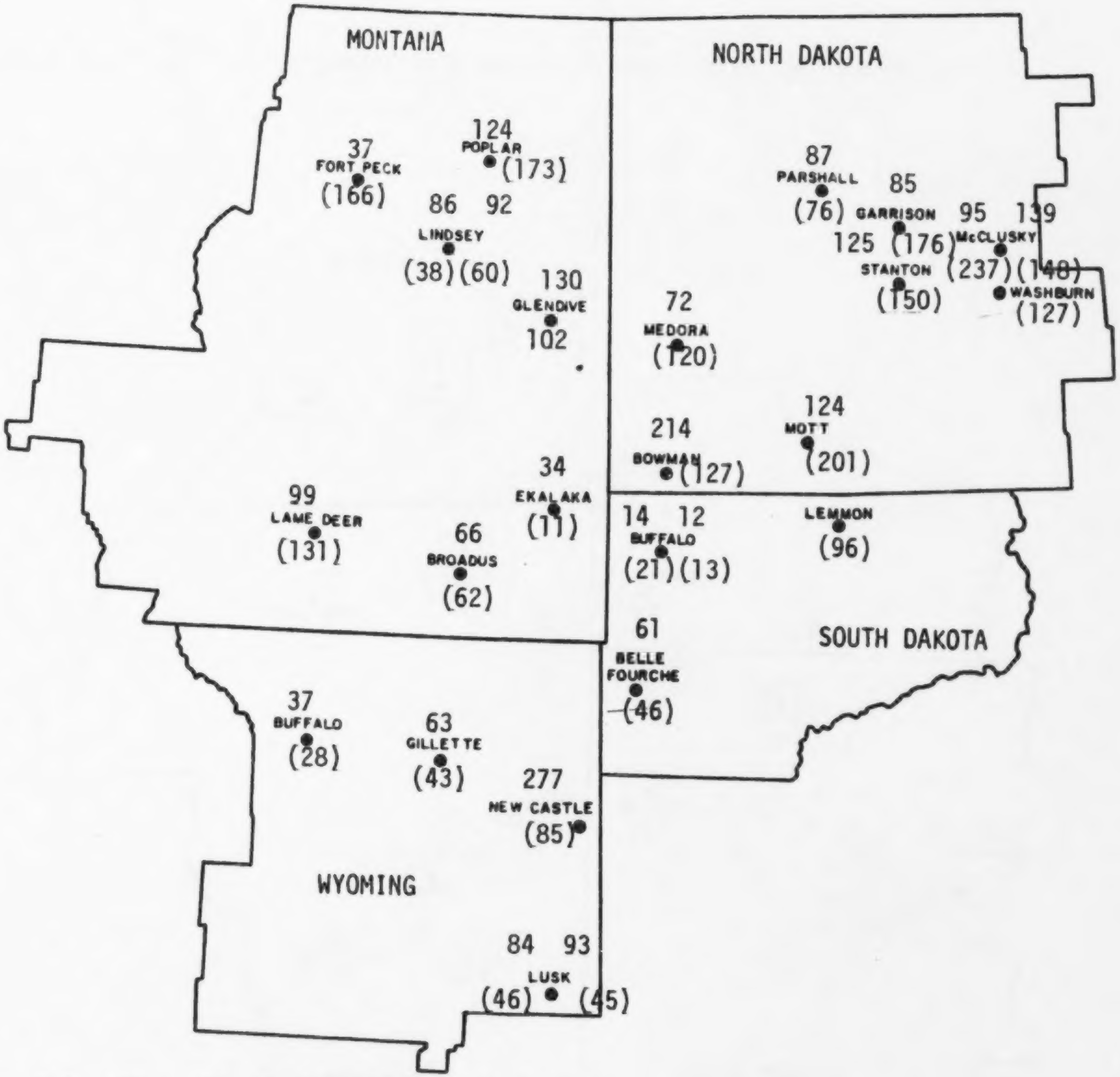

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
37
FORT PECK
(166)
124
POPLAR
(173)
86 92
LINDSEY
(38) (60)
130
GLENDIVE
102
99
LAME DEER
(131)
66
BROADUS
(62)
34
EKALAKA
(11)
87
PARSHALL
(76)
85
GARRISON
125 (176)
95 139
McCLUSKY
(237) (148)
STANTON
(150)
WASHBURN
(127)
72
MEDORA
(120)
214
BOWMAN
(127)
124
MOTT
(201)
14 12
BUFFALO
(21) (13)
LEMMON
(96)
61
BELLE FOURCHE
(46)
37
BUFFALO
(28)
63
GILLETTE
(43)
277
NEW CASTLE
(85)
84 93
LUSK
(46) (45)

Figure 3.8 '75 - '76 Maximum 24 hr. TSP Values
'76 ( )

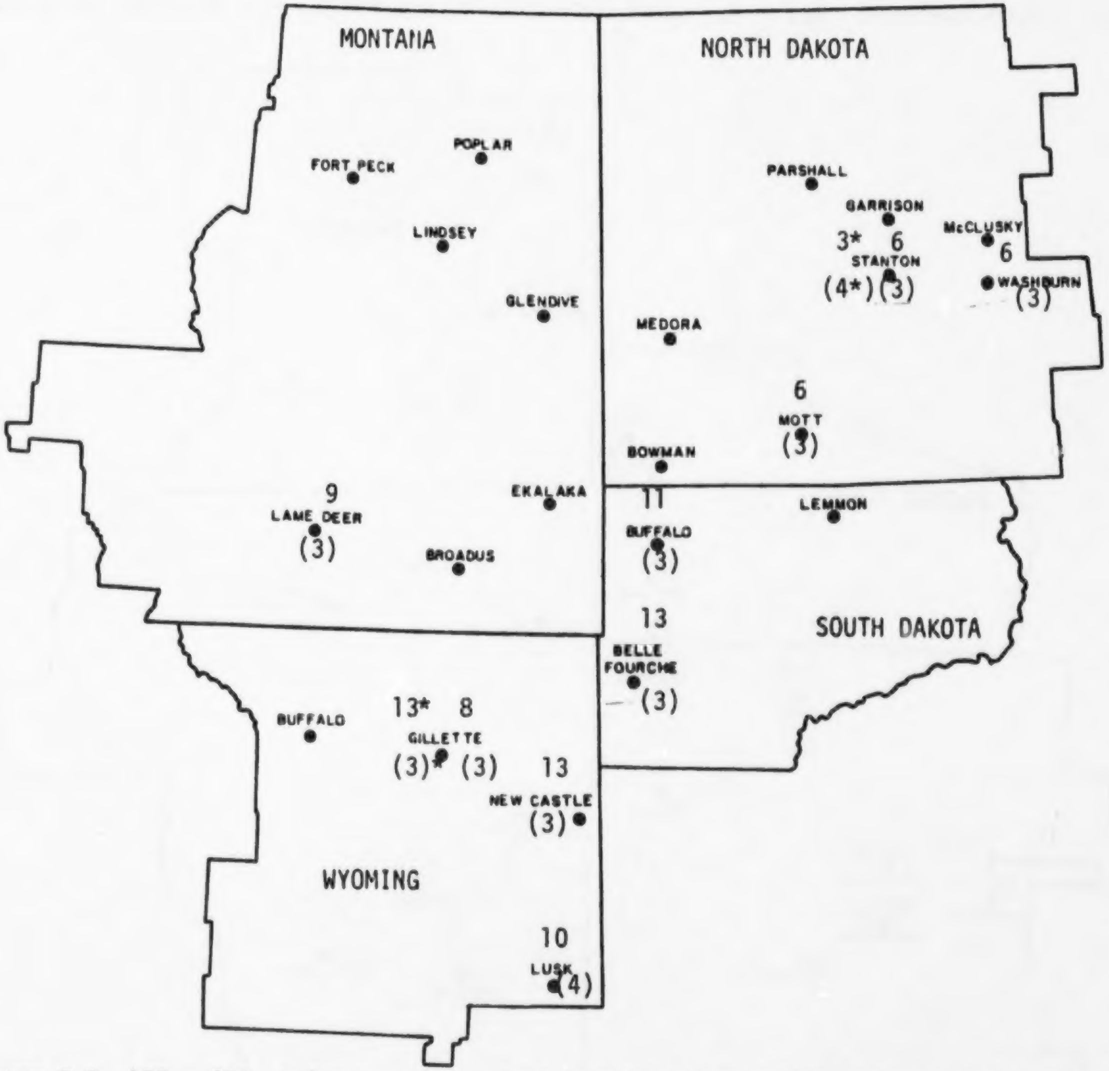

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
FORT PECK
POPLAR
LINDSEY
GLENDIVE
9
LAME DEER
(3)
EKALAKA
BROADUS
PARSHALL
GARRISON
3* 6
STANTON
(4*) (3)
McCLUSKY
6
WASHBURN
(3)
MEDORA
6
MOTT
(3)
BOWMAN
11
BUFFALO
(3)
LEMMON
13
BELLE FOURCHE
(3)
BUFFALO
13* 8
GILLETTE
(3)* (3)
13
NEW CASTLE
(3)
10
LUSK
(4)

Figure 3.9 '75 - '76 Calendar year annual arithmetic mean SO_2 values - bubblers unless noted
'76 ( )

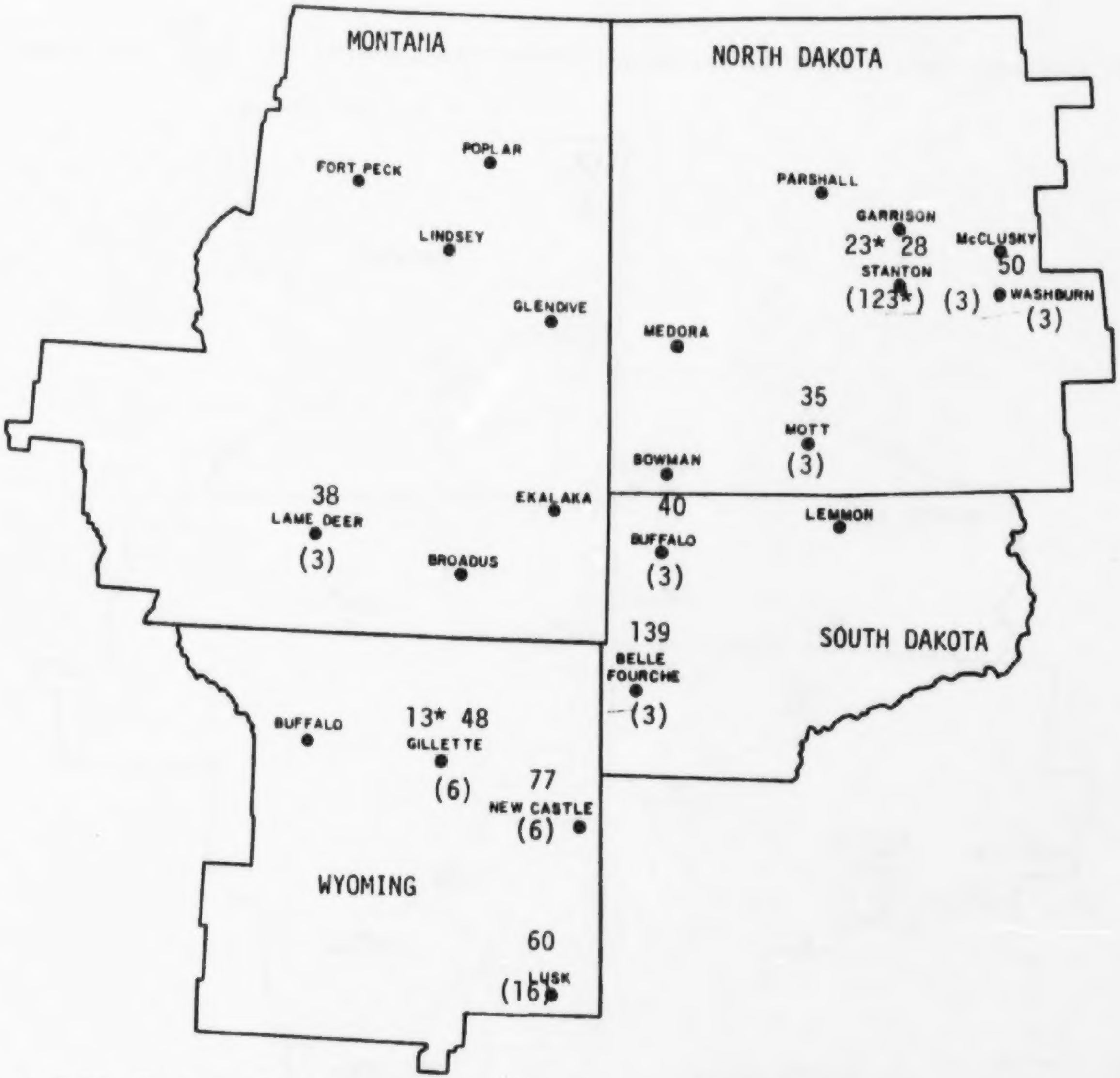

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
FORT PECK
POPLAR
LINDSEY
GLENDIVE
38
LAME DEER
(3)
EKALAKA
BROADUS
PARSHALL
GARRISON
23* 28
McCLUSKY
50
STANTON
(123*) (3)
WASHBURN
(3)
MEDORA
35
MOTT
(3)
BOWMAN
40
BUFFALO
(3)
LEMMON
139
BELLE FOURCHE
(3)
BUFFALO
13* 48
GILLETTE
(6)
77
NEW CASTLE
(6)
60
LUSK
(16)

Figure 3.10 Maximum SO_2 Values during calendar year '75 - '76 Bubblers unless noted
'76 ( )

* Continuous

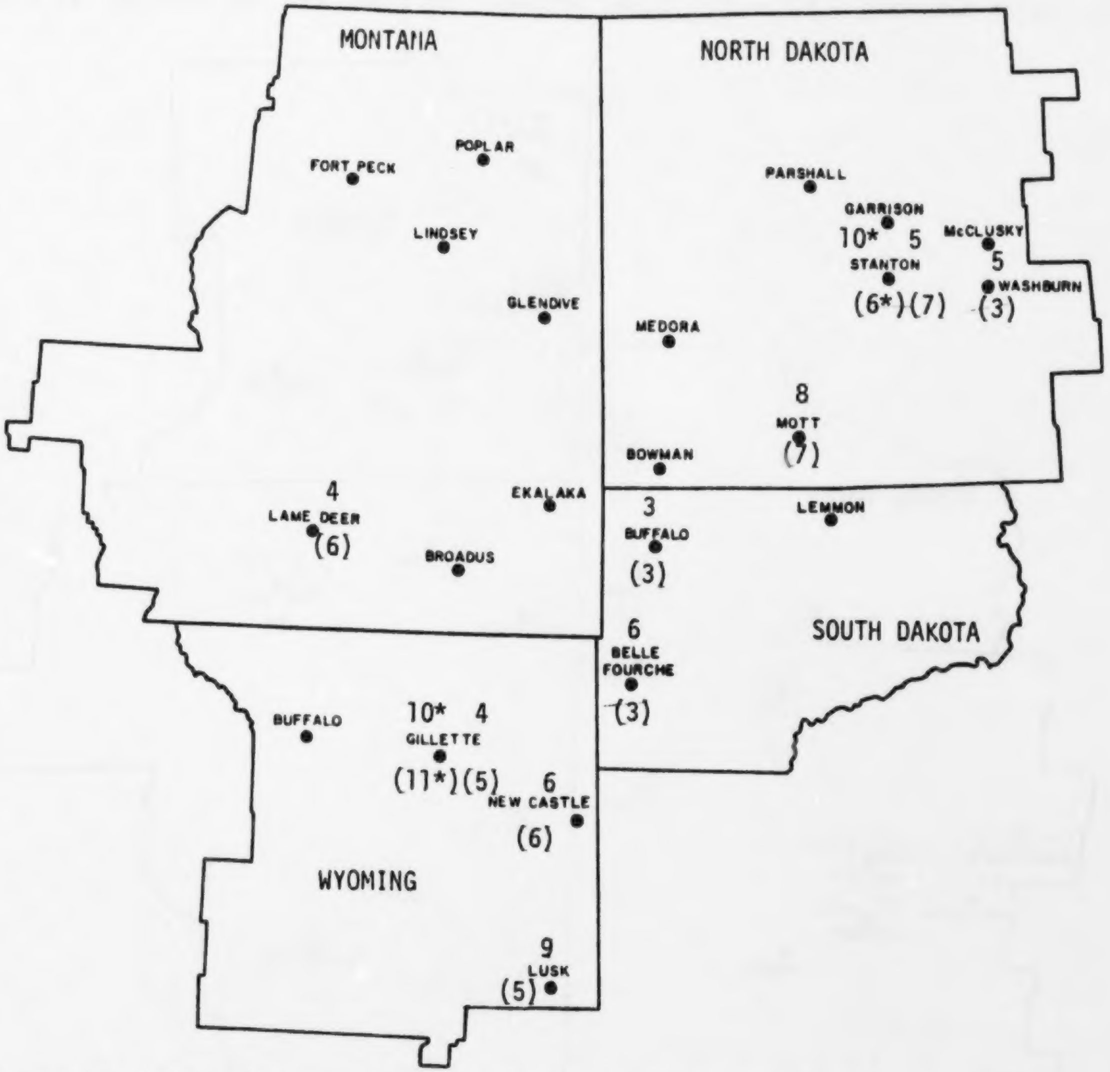

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
FORT PECK
POPLAR
LINDSEY
GLENDIVE
4
LAME DEER
(6)
EKALAKA
BROADUS
PARSHALL
GARRISON
10* 5
STANTON
(6*) (7)
McCLUSKY
5
WASHBURN
(3)
MEDORA
8
MOTT
(7)
BOWMAN
3
BUFFALO
(3)
LEMMON
6
BELLE FOURCHE
(3)
BUFFALO
10* 4
GILLETTE
(11*) (5)
6
NEW CASTLE
(6)
9
LUSK
(5)

Figure 3.11 '75 - '76 Calendar Year Annual Arithmetic Mean NO_2 Values - Bubblers unless noted
'76

*Continuous

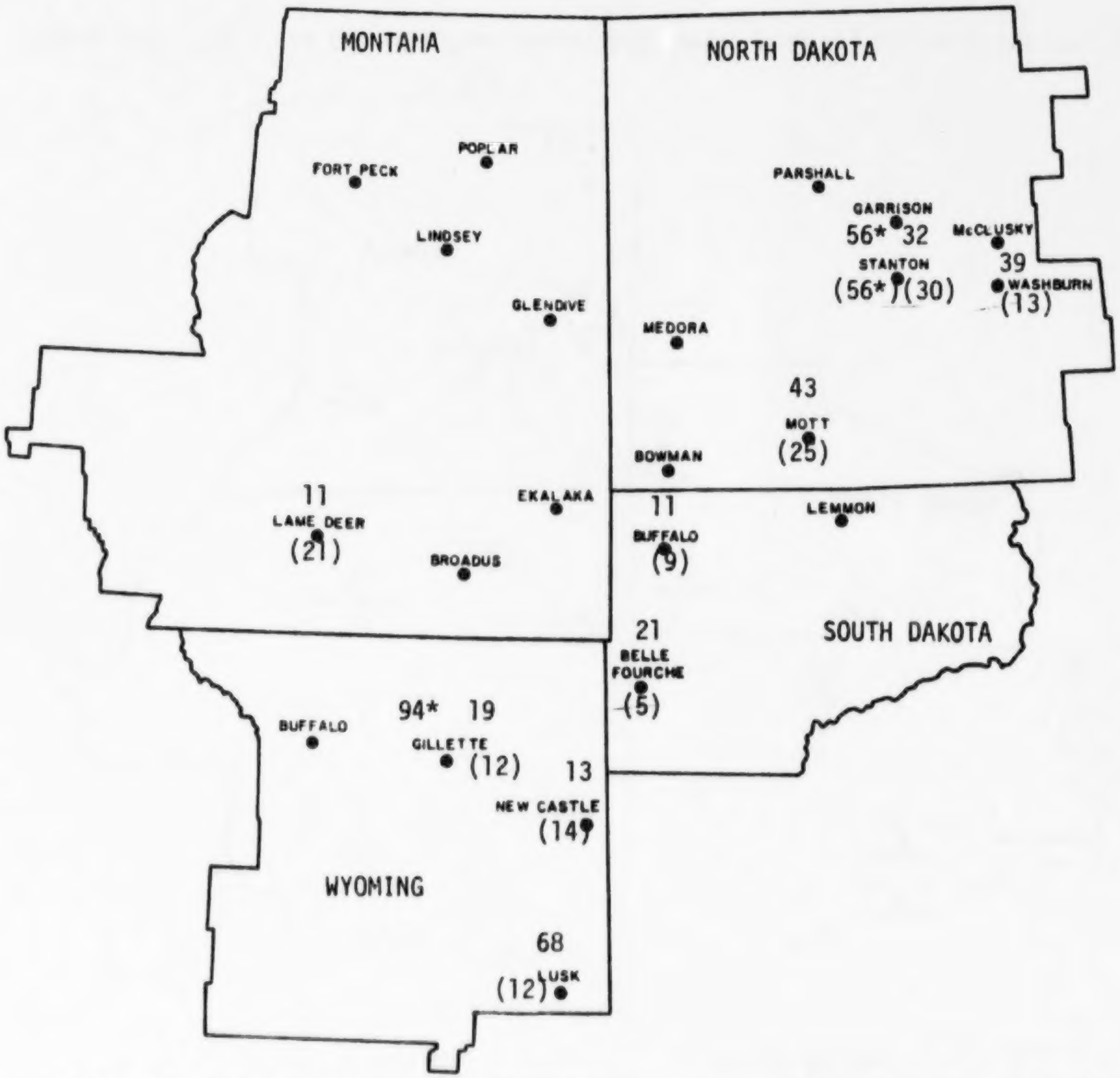

MONTANA
NORTH DAKOTA
SOUTH DAKOTA
WYOMING
FORT PECK
POPLAR
LINDSEY
GLENDIVE
11
LAME DEER
(21)
BROADUS
EKALAKA
PARSHALL
GARRISON
56* 32
McCLUSKY
39
STANTON
(56*)(30)
WASHBURN
(13)
MEDORA
43
MOTT
(25)
BOWMAN
11
BUFFALO
(9)
LEMMON
21
BELLE FOURCHE
(5)
BUFFALO
94* 19
GILLETTE
(12)
13
NEW CASTLE
(14)
68
LUSK
(12)

Figure 3.12 Maximum NO_2 Values from Calendar Years '75 - '76 - Bubblers unless noted
'76 ( )

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO.
EPA-908/4-77-01

2.

3. RECIPIENT'S ACCESSION NO.
PB277673

4. TITLE AND SUBTITLE
Ambient Air Quality Monitoring Network
EPA Region VIII Energy Areas

5. REPORT DATE
October 1977

6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)
George Boulter, Barry Levene

8. PERFORMING ORGANIZATION REPORT NO.

9. PERFORMING ORGANIZATION NAME AND ADDRESS
Same as box 12.

10. PROGRAM ELEMENT NO.

11. CONTRACT/GRANT NO.

12. SPONSORING AGENCY NAME AND ADDRESS
USEPA, Region VIII
1860 Lincoln St.
Denver, Colorado 80295

13. TYPE OF REPORT AND PERIOD COVERED

14. SPONSORING AGENCY CODE
908/00

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The ambient air quality monitoring network located in Energy development areas in the states in Region VIII (Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming) is described. The data collected from these monitoring locations for several years is summarized. Comparisons between data collected in 1975 and 1976 at selected monitoring sites is presented.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
1) Air Pollution 2) Monitoring 3) Energy - Envrionemntal Baseline	1) NGPRP Data 2) Colorado, Montana, Utah, North Dakota, South Dakota, Wyoming 3) Energy Areas	

18. DISTRIBUTION STATEMENT

19. SECURITY CLASS *(This Report)*

20. SECURITY CLASS *(This page)*

21. NO. OF PAGES
157

22. PRICE
A08 - A01

EPA Form 2220-1 (9-73)